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Historical Notes (No. 15)———

—A FRENCHMAN NAMED O'REILLY— MODERN BLEACHING — 150 YEARS AGO

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New York, N Y

This is the fifteenth in a series of historical articles which the textile chemist and colorist will find of interest.

The author, a prominent science historian, is the founder of an outstanding collection of great works, documents and letters in the history of chemistry and related sciences.

Articles and illustrations in this series are from the author's library.

IN recent months the progress of scientists and technicians of other nations in many fields has made plain to America that we must know more about the scientific and technical work being done in other countries. Examples have been cited within the last year of the expenditure of large sums in this country for solutions to problems which already had been solved and discussed in foreign technical journals. It now seems obvious that we must have better translations of all foreign publications, and these must be brought quickly to the attention of American scientists and technicians. We recognize that we must move more efficiently across space boundaries in making use of the knowledge obtained and published by other peoples.

There is another direction to be taken for knowledge which we must not forget—back into time. While we cry for the latest information on our competitor's doings, what about information on the work of our own technical ancestors? Because some inventions are old or may not be known today, does this mean that they have no bearing on our modern problems? Many things which we are doing today are simply rediscoveries of the old ideas of the past.

Let us take for example the system of continuous cotton bleaching which is so important in this country today. In a discussion of the "new" continuous peroxide bleaching processes reported in *American Dyestuff Reporter* in 1944, the authors had this to say (*1*):—

> "Basically, continuous peroxide bleaching in its latest form is made possible by the use of direct steam for heating the goods. In the kier, steam is used directly or indirectly to heat solutions which in turn heats the cloth. In this new process the large amounts of water used in the kier have been eliminated and it is the use of direct steam on the cloth, carrying more concentrated chemical solutions, that make it possible to put the 'continuous' in the continuous bleach."

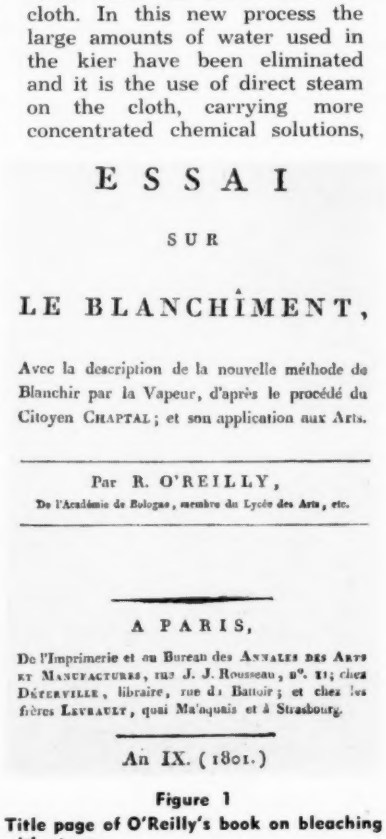
Will it surprise the reader to learn that this basic idea of using steam to heat cotton and linen fabric saturated with caustic or other chemicals without a kier and without pressure in order to obtain efficient scouring and bleaching was in commercial use and discussed in books and journals more than 150 years ago?

Our story starts, surprisingly enough, with a Frenchman by the name of O'Reilly, in the year 1801. In that year O'Reilly published in French at Paris a volume of 226 pages entitled (*2*):—

> "An Essay on Bleaching, with a Description of the New Method of Bleaching by Steam, According to the Process of Citizen Chaptal; and its Application to the Arts." (See Figure 1).

O'Reilly sets the tone for our thesis with his preface written with enthusiasm and in the flowery language of the times (*3*):—

> "The art of bleaching, whose origin is lost in the darkness of centuries, seemed condemned to grow old in an eternal state of immaturity when Berthollet disclosed the use of oxygenated muriatic acid (chlorine), and in one fell swoop placed bleaching at the same level as the most advanced arts: thus the obscure chrysalid, after having vegetated for a long time in the bonds of an imperfect life, unfolds its unexpected wings and takes flight above those who have trampled it under foot.
>
> "Now, genius has answered the call of genius: Chaptal has elevated ordinary steam, and this



ESSAI

SUR

LE BLANCHÎMENT,

Avec la description de la nouvelle méthode de Blanchir par la Vapeur, d'après le procédé du Citoyen CHAPTAL; et son application aux Arts.

Par R. O'REILLY,

De l'Académie de Bologne, membre du Lycée des Arts, etc.

A PARIS,

De l'Imprimerie et au Bureau des ANNALES DES ARTS ET MANUFACTURES, rue J. J. Rousseau, n°. 11; chez DÉTERVILLE, libraire, rue du Battoir; et chez les frères LEVRAULT, quai Malaquais et à Strasbourg.

An IX. (1801.)

Figure 1
Title page of O'Reilly's book on bleaching with steam

light mist conceals within its bosom one of the most mysterious secrets of nature. This gas which man makes himself, bleaches in several hours substances whose stubborn color forces atmospheric air to beg for the help of time over several months.

"The astonished arts hasten to call upon such a powerful assistant, and bleaching with steam triumphs over all the prejudices of habits: above all every one is burning to know the improvements which have already brought to perfection a discovery so recent: on all sides its inventor is questioned: but the confidence of the government has placed him at the head of an administration so vast that he cannot reply to so many voices nor carry out the project that he previously had planned of writing on this interesting subject.

"I am the one whom he has chosen to draw up an essay strongly called for by an impatient public—Special needs are spreading out the domain of bleaching with steam. This brilliant discovery will not limit its utility to the important services which it has already rendered. It will penetrate into the simplest workshops, and will give birth perhaps to other discoveries just as daring. I shall receive the sweetest reward for my efforts, if I have contributed to the progress of the arts by spreading abroad the understanding of a process of which they should be proud."

Before we examine in detail O'Reilly's steam process, we must look at the status of the art of bleaching at the time. For centuries, the process of bleaching linen and cotton was based on boiling the yarn or fabric in alkali, spreading out the textiles in the fields for exposure to the sun for several days, and then repeating the process many times. Several months were usually required to obtain a satisfactory bleached linen or cotton fabric by this process. In 1785 Berthollet had discussed the bleaching action of chlorine, and in 1789 he published a detailed description of a method for bleaching fabrics and yarns through the use of chlorine. Berthollet's process was in fairly wide use at the time O'Reilly published his volume on bleaching with steam (*4*).

Now, it has been thought generally that the discovery of the bleaching action of chlorine completely revised the whole bleaching process. Actually, this was not so. The action of chlorine was simply substituted for the action of air and light in the old-fashioned bleaching process. The long, drawn-out boiling or "bowking" process was still an important part of the bleaching process of Berthollet. In addition, the handling of chlorine and its manufacture was a very difficult problem because of its corrosive effect on materials of construction normally used in wet textile processing at the time.

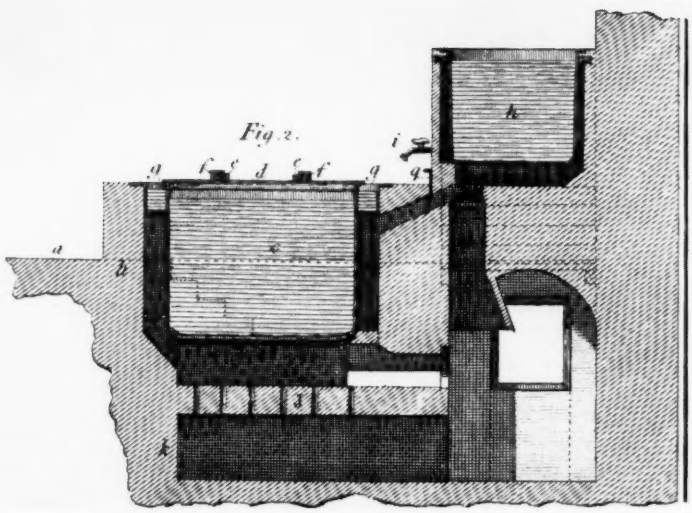


Figure 2
Apparatus for alkaline boil with Berthollet's process

A typical process for Berthollet's "new scientific" method of bleaching with chlorine involved the following steps (*5*):—

1) Steep 24 hours in water or in dilute lye to remove loom dressing.
2) Steep in fresh alkaline lye to remove coloring matter from cloth in order to prevent too much chlorine being used up later.
3) Wash in water.
4) Treat with chlorine solution three hours, squeeze.
5) Scour several hours in hot alkali.
6) Steep one-half hour in chlorine solution.
7) Scour again in hot alkali.
8) Wash in soap solution.
9) Wash in alkaline lye.
10) Immerse in chlorine solution again.

Berthollet noted that, in general, 4 to 8 boilings with an equal number of chlorine immersions were needed for bleaching the fabric.

Figure 2 shows a section through the "latest-style" apparatus for the alkaline boil used as a part of Berthollet's bleaching method around the year 1800. 'c' represents the vessel containing the alkaline liquor which is kept near the boil by a fire built in the brickwork underneath (j r). 'h' is a reservoir of stronger alkali which is also kept hot by heat from the boiler. 'd' is a wooden cover fitted with vents. 'a' is the floor of the shop.

The operation of this apparatus is explained by one of Berthollet's disciples, Pajot des Charmes (*6*):—

"Upon a kind of iron platform, composed of two or three concentric rings connected together by cross pieces of the same metal, which rests on the bottom of a boiler set in a furnace for the saving of fuel, are placed the piece goods, threads, etc, in folds or parcels. When these different kinds of goods are to be immersed together in the alkali, the piece goods must always be placed at the bottom. When the boiler is thus charged, the alkaline solution at the strength of a degree and a half under zero of the aerometer, must be poured in until the mass of the goods are soaked, and covered to the depth of at least an inch or two without pressing them too much down, or the alkaline solution may be poured in, accordingly as the goods are placed in the copper. To prevent these from rising and floating above the surface of the lees, a flat cover is fitted to the boiler, which serves to retain the heat, and prevent any dirt from falling upon the goods.

"A judgement is formed that the pieces are in a state to be taken out of the fluid, when this

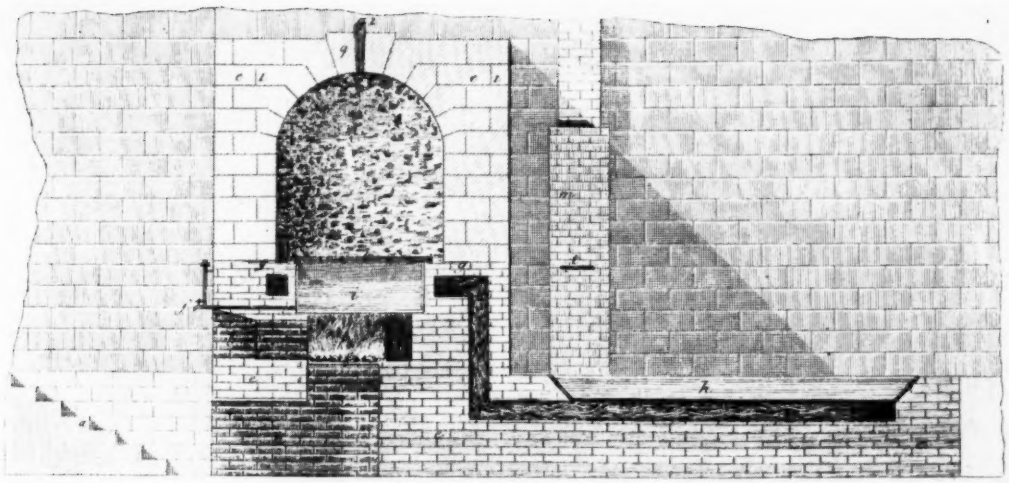


Figure 3
Chaptal's apparatus for bleaching with steam

last under the cover in the middle of the heap is too hot to admit of the hand being held in it, or when it simmers round the circumference of the boiler and throws up white bubbles, which circulate towards the center. It is not necessary that the lees should boil; the essential conditions are, that it should be sufficiently strong, abundant and hot; and that it should properly penetrate the goods which are submitted to its action.

"When the goods are to be taken out of the copper, the cords, or chains, which are fixed to the exterior circle of the stage are to be raised, and hooked to the fall or rope of a crane placed on one side of the boiler; by turning which crane, the whole of the goods are raised out of the copper, and after they have drained for a certain time, the mass is conveyed and placed upon two cross pieces over a tub designed to receive the subsequent drainings; after which, the several pieces are pressed or wrung, and afterwards rinsed in a stream, if the manufacturer possesses that convenience, or, otherwise, they are washed by means of a revolving cylinder, or other machinery. These operations are to be repeated as often as the goods are taken out of the alkaline lixivium, according to the nature of the merchandize; for it may easily be imagined, that piece-goods, hosiery and thread, will require different kinds of manipulation."

Obviously, even one such alkaline boiling would have been time consuming and expensive, but at least four were required with Berthollet's "new chemical" method of bleaching.

Now back to O'Reilly. According to him, the original idea of bleaching with steam was first published by Chaptal, the famous chemist and Minister of the Interior under Napoleon. Chaptal had published about 1799 a notice on a method of bleaching by steam which had come from the Levant and which was in use in the middle of France under the name of "bleaching by smoke." Up until the time that Chaptal published his essay, the process had been kept completely secret and was known to only a few textile plants. A Mr Bawens, the owner of a cotton mill situated near Passy, built an apparatus for bleaching with steam as suggested by Chaptal and his results were excellent. According to O'Reilly, Bawens, with this equipment, was able to bleach two or three thousand pounds of cotton a day at a price so low and with such ease that no other method of bleaching could be compared with this one.

Figure 3 shows a section through this apparatus for bleaching with steam, built by Bawens and shown in O'Reilly's book. 'i' is a vessel in which a solution of caustic is brought to the boil. The steam from the boiling alkali penetrates through a grill, 'h,' through the mass of goods packed in the steam chamber 'r.' 'p' shows the fire box and the heat and the gasses from 'p' are conveyed in a circular manner around the boiling alkali at 'c' for maximum heat efficiency. The goods are first saturated with the liquor by entrance through the top. The liquor percolates through the goods down to the caustic boiler. If desired, the goods can be passed through the caustic before packing into the steam chamber. The caustic liquor is kept at a vigorous boil and vapors from the liquor penetrate into the upper chamber and through the goods. In no case does the goods actually lie in the caustic liquor since the wooden grill, 'h', keeps them out of contact. The condensation drips slowly back into the caustic boiler. The whole arrangement is thoroughly covered with brickwork for maximum heat savings. According to O'Reilly, Chaptal's directions for bleaching cotton in this apparatus were as follows (7):—

"The cotton in the form of bundles is impregnated with a weak solution of soda made caustic by the use of lime. This operation is carried on in a vessel made of wood or stone. When the cotton has been evenly penetrated by the alkaline liquor it is brought to the steamer and placed on the wooden grill; the excess liquor runs through the bars into the boiler below which permits heating the mass without fear of burning the cotton. To prepare the alkaline bath one uses soda of alicante, 10% on the weight of the cotton; in a steamer which I have described one can work at one time about 800 livres of cotton. The alkali solution is ordinarily kept at 2°. After the cotton has been introduced and arranged in the steamer, the main opening is covered with its cover, the small opening is completely closed and kept that way until the steam developed by the fire has reached the top of the steamer and has penetrated into the cotton. Once the steamer is filled, the heat in the furnace is raised and the alkali

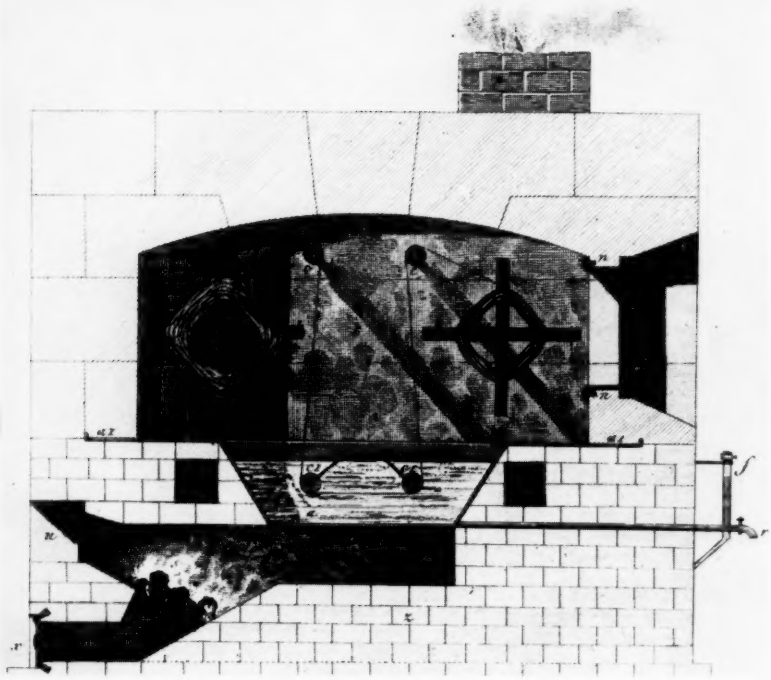


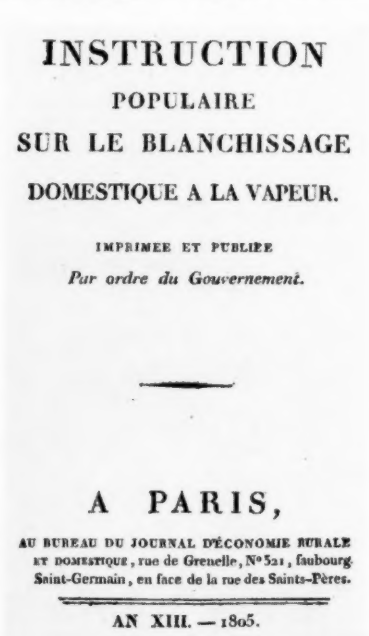
Figure 4
O'Reilly's semicontinuous open-width caustic steamer

is kept boiling lightly for 36 hours. The bath is then allowed to cool and the apparatus is opened, the cotton is washed with care and exposed in the fields two or three days, the cotton now has acquired a satisfactory degree of bleaching."

Now, of course, in comparing this process with modern methods, it certainly appears to be time-consuming. Compared with the ancient process requiring many boilings in alkali and many days' exposure in the sun, Chaptal's process was certainly quick and comparatively inexpensive. Compared to Berthollet's chlorine process, Chaptal's single steaming together with only two or three days' exposure in the grass was quicker and required less chemicals and fuel than the four boilings and four chlorine treatments.

Now Berthollet in his process had kept the old method of scouring and only added a quicker oxidation method to substitute for the slow oxidizing and bleaching effect of air and light. Chaptal, doing the reverse, had replaced the old scouring process with a new and more efficient steaming method but still made use of light and air for the final oxidation and bleaching action.

O'Reilly carried the process of steam bleaching further than Chaptal. He not only invented machinery for the open width semicontinuous treatment of the goods with caustic and steam but also put forward the idea of using chlorine bleaching as the final step instead of exposure to air. Thus, O'Reilly modernized the bleaching process 150 years ago by combining the advantages of Chaptal's efficient



INSTRUCTION

POPULAIRE

SUR LE BLANCHISSAGE

DOMESTIQUE A LA VAPEUR.

IMPRIMEE ET PUBLIÉE

Par ordre du Gouvernement.

A PARIS,

AU BUREAU DU JOURNAL D'ÉCONOMIE RURALE ET DOMESTIQUE, rue de Grenelle, N° 521, faubourg Saint-Germain, en face de la rue des Saints-Pères.

AN XIII. — 1805.

Figure 5
Title page of Cadet-de-Vaux' little book for the laundress

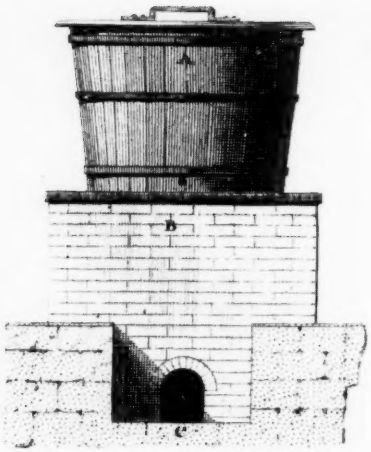


Figure 6
Home apparatus for caustic-steam laundering process (Cadet-de-Vaux)

caustic steam method with Berthollet's quick chemical oxidation.

Figure 4 shows a section through one type of apparatus for the open width caustic-steam scouring of cotton invented by O'Reilly. In 'a,' a dilute solution of caustic soda is kept boiling while the goods slowly pass down and through it. The boiling caustic solution keeps the chamber above filled with steam which constantly reacts with the goods. The goods are slowly wound back and forth during a period of several hours. In this equipment the goods are kept constantly saturated with caustic and a fresh fabric surface is constantly presented to the action of the stream. According to O'Rielly, two hours operation within this apparatus was sufficient to do a thorough job of bleaching the goods. The goods could be removed to another apparatus for a final treatment with chlorine, or, actually, the same apparatus could be used by removing the alkaline liquor and substituting a chlorine solution.

O'Reilly was intrigued with "steam bleaching." He could see many other uses besides commercial bleaching for this wonderful mist that anyone could make. Its power could save the people of France money, fuel, time and toil. O'Reilly at the end of his book concludes (*8*):—

"A simple comparison of the process of bleaching with steam with the other methods which I have described demonstrates its great superiority because of economy of time, materials, fuel and handling, notwithstanding the additional advantage of not damaging the material; but there is also an application of this principle of

Figure 7
Chaptal

great importance and which interests all classes of society; I wish to speak of the bleaching (cleaning) of linen. Here one only needs as the agent the simple action of steam. An agent powerful and efficacious enough to take the place of the alkalies and the soap solutions used by laundresses. This process offers also the great advantage of conserving the linen over a long period since it is not necessary to handle it with violence as is required in the ordinary methods of manipulation as well as to economize in the use of soap and fuel. An apparatus similar to that of Troyes, in the inside of which one places household linen exposed to the steam of a solution of only a quarter of a degree in strength, is enough to completely remove the dirt with which it is ordinarily covered and with only a rinse in river water, or if one wishes, in a very weak soap solution one washes away all of the impurities and obtains a dazzling whiteness.

"It is up to the various administrations to take over this process and to apply it to the hospitals and other public establishments where it will offer a considerable economy for the state."

Thus, in 1801, O'Reilly showed that the steam-caustic method could also be substituted for the normal process of laundering with great savings in fuel, chemicals and time.

Within a short time the French government had taken up the promotion of O'Reilly's simple method for washing or laundering linen in place of the normal expensive and time-consuming method which involved long boilings in solutions of soda and soaps. By 1805 the well known chemist, Cadet-de-Vaux, had published a handbook at the government's insistence, for the use of laundresses, entitled, "Treatise on the Domestic Laundering with Steam" (*9*). In this little treatise, which was widely distributed, Cadet presented the new caustic-steam method of laundering in language understandable to the most ignorant laundress. In addition, he designed a simple apparatus which could be used in any home. (See Figures 5 and 6).

The hospitals of France also took up the method for laundering their linens according to the instructions of O'Reilly and actually made use of the savings offered by the process at a time when chemicals and fuel were scarce and of the utmost importance because of the Napoleonic wars.

But what happened to O'Reilly's caustic-steam process for commercial bleaching? The fact is that, within a few years, it was forgotten. Blachette in his authoritative "Theoretical and Practical Treatise on Bleaching" published in Paris in 1827 did not even mention Chaptal's or O'Reilly's process (*10*). At that time the process for commercial bleaching still depended on several boilings of the goods in alkaline baths with the goods thoroughly submerged in the liquor, followed by treatments with chlorine solutions. Blachette said that he had visited all of the bleacheries in France and the apparatus for alkali treatment, while improved, was still based on the method of 'bowking' in use for hundreds of years. By 1860 the kier had come into use but the goods were still being boiled submerged in an alkaline liquor in rope form which was followed by treatment with chlorine in solution (*11*).

Figure 8
Berthollet

Almost a century and a half had to pass before the ideas of O'Reilly and Chaptal were again in use.—In use, not because their work had been examined and studied but only because their ideas had been rediscovered and applied under modern conditions which insured their success. We may wonder whether the modern continuous processes of bleaching depending on caustic and steam treatment without pressure might not have been in use many years earlier if those engaged in bleaching had listened to the Frenchman with the Irish name, O'Reilly.

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(*2*) O'Reilly, R, "Essai sur le Blanchiment, Avec la description de la nouvelle methode de Blanchir par la Vapeur, d'apres le procede du Citoyen Chaptal; et son application aux Arts", Paris (1801).
(*3*) Ibid, p VII-XII.
(*4*) Berthollet, "Essay on the New Method of Bleaching," translated by Robert Kerr, Edinburgh (1790).
(*5*) Ibid, p57-61.
(*6*) des Charmes, Pajot, "The Art of Bleaching Piece Goods, Cottons, and Threads of Every Description," p74-5, London (1799).
(*7*) O'Reilly (see Ref 2), p148-150.
(*8*) O'Reilly (see Ref 2), p167-170.
(*9*) Cadet-de-Vaux, "Instruction Populaire sur le Blanchissage Domestique a la Vapeur," Paris (1805).
(*10*) Blachette, L J, "Traite Theorique et Pratique du Blanchiment des Toiles de Lin, de Chanvre et de Coton," Paris (1827).
(*11*) Matthews, J M, "Bleaching and Related Processes", p268-289, New York (1921).

TEAR SHEETS AVAILABLE

Tear sheets of articles which have appeared in AMERICAN DYESTUFF REPORTER since July, 1956 are available in limited quantities. (Consult year-end indexes for list of titles). These may be obtained by sending a stamped, self-addressed envelope along with a request for the specific articles. Write TEAR SHEETS, American Dyestuff Reporter, 44 East 23rd St, New York 10, NY.

Abstracts

Possibilities and Limitations of the Application of Pigments to Textiles

Kass, W, *J Soc Dyers Col* **74**, 14-19, January, 1958.

This paper is confined to the fixation of pigments with the aid of synthetic resins.

The most important types of resins suitable for the fixation of pigments are 1) phenol-formaldehyde, 2) urea-formaldehyde, 3) melamine-formaldehyde, 4) alkyds, 5) vinyl, acrylic and styrene resins, 6) synthetic latices, 7) polyurea and polyurethane resins. Other ingredients, such as softeners, catalysts, thickeners, defoamers and emulsifiers are usually added.

The film formed by the resin must have high fastness to abrasion and maximum flexibility, and must remain transparent and colorless.

The suitability of a pigment for use in textiles is governed by particle size, degree of dispersion, electrical charge, specific gravity, hardness and degree of solubility. Almost complete insolubility in water is commonly understood. Insolubility in drycleaning solvents is another valuable property.

The author discusses the influence of the fiber on the application of pigments. While it is sometimes assumed that the substrate has no effect, since there is no direct affinity between fiber and pigment, actually considerable variations do result, dependent on the substrate (capillarity, chemical nature, absorptive properties, etc).

Pad dyeing is the most suitable method for use with pigments. The author recommends that the drying be carried out evenly and simultaneously from both sides (eg, in a hot flue).

Application of pigments in direct printing is particularly economical because it is possible to eliminate any wet aftertreatment. The author discusses the printing technique at some length, and points out that nearly all the pigment processes have the disadvantage that there is a certain tendency to transfer color into the next color box.

For many binders baking gives the maximum fastness properties, but in certain circumstances, where the maximum fastness is not required, steaming of these binders gives adequate results.

Stability of the print paste and the ease of fixation are inversely proportional. Naturally, print pastes of high stability require high temperatures and the use of catalysts for fixation.

The author offers suggestions where pigments are used as supplementary colors to dyes of other groups in a pattern. He also discusses resists under Aniline Black, Azoic Diazo Components and Fast Color Salts.

Pigment processes are especially popular for screen printing. The author recommends screens made of polyester filaments, in preference to bronze gauze.

Other types of printing discussed are flocking, fluorescent and phosphorescent dyes, pigment white, and spray printing.

Finally, the author considers the limitations to the use of pigments (due to the characteristics of the binders). No resins exist, he says, which are absolutely insoluble in the solvents with which they come into contact during use or cleaning.

A long discussion followed the delivery of the paper.

Acetal Cellulose Reactants

Irvine, J B and Kress, B H, *Textile Research J* **28**, 148-58, February, 1958.

Urea derivatives have been used for years in the textile industry. They have been applied to a large and still increasing volume of fabrics. However, they suffer from certain disadvantages.

One of the serious shortcomings of urea-derivative chemicals is the fact that chlorine bleaching of treated fabrics permits chloramine formation. Subsequent heating by ironing results in the release of hydrochloric acid, which weakens and discolors the fabric. This property of chlorine retention by treated fabrics has been the cause of a growing volume of discussion and a considerable amount of fabric-finishing experimental work. The outcome of one such research and fabric-finishing program on this subject is a group of products which may be termed acetal cellulose reactants.

Acetals are rather easily prepared derivatives of aldehydes. They can be made from two moles of an alcohol and one mole of aldehyde in the presence of an acid or metal halide catalyst.

The acetal cellulose reactants are a group of materials which produce nonchlorine - retentive dimensional control and a wide variety of hand effects. Three tvpes of these reactants are discussed. Two are in commercial use and one is in the development stage. A general description of the nature of their reactions with cellulose is followed by an analysis of the data from the laboratory evaluations of mill-processed fabrics.

Of the products now in commercial use, Quaker Reactant SC is used to impart permanent dimensional control with a completely soft hand, or a permanently built hand when used with starch ethers. Quaker Reactant 16 is used to impart a bulky hand, and to add bulk to crease-resistant finishes. Both products are odorless and nonyellowing, and do not affect the abrasion resistance of the fabric.

A New Acrylic Fiber

Anon, *Textile Recorder* **75**, 56-7, January, 1958.

To the ever-growing range of manmade fibers Courtaulds has now added a new acrylic fiber, Courtelle, which is expected to have a promising future, particularly in the field of wool-like fabrics.

Courtelle is basically a polyacrylonitrile compound and is of mineral origin. It is roughly circular in cross-section. It has excellent resistance to chemicals and is not attacked by moths or mildew. It does not melt on heating, but sticks at 560° F. In appearance it is a low-density, creamy-white fiber which combines the bulkiness, resilience and warmth of wool with good tensile properties in both the wet and dry state, and good light stability.

Two qualities are available, "standard" and "high shrinkage"; the "standard" material has been dimensionally stabilized to boiling water, in which it shrinks only about one percent, whereas the "high shrinkage" fiber is in a condition which gives 15-17 percent contraction. By judicious blending of the two types the high-bulk effect can be obtained. This is of particular value in knitwear.

Courtelle has been specially developed to dye with basic dyes. Selected Sevron, Deorlene and Maxilon dyes have excellent lightfastness, as well as good fastness to washing, perspiration and sublimation. Dyeing is carried out in conventional machines at the boil. Disperse dyes are recommended for pale shades only.

Courtelle is suitable for a variety of uses. It is expected to have a wide appeal in knitwear, particularly for sweaters, cardigans and underwear, as well as in jersey fabrics. In woven goods, blends with wool containing more than 50 percent of Courtelle can be permanently pleated. The fiber is also recommended for blankets and pile fabrics.

Courtelle is now commercially available in limited quantities, and is expected to be in full-scale production early in 1958.

Proceedings of the

American Association of Textile Chemists and Colorists

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April 21, 1958

36th Annual Convention———

EFFECT OF LAUNDERING ON CHLORINE RETENTION AND CREASE RESISTANCE OF COTTON FINISHED WITH DIMETHYLOL ETHYLENE UREA*

OSBORNE C BACON, J EDWARD SMITH and LEHMAN E HUGHES

Technical Laboratory
Organic Chemicals Department
E I duPont de Nemours & Co, Inc
Wilmington, Del

A general discussion of the problem of damage from chlorine retention from crease-resistant finishes on cotton fabrics is presented. Data on crease resistance, tensile strength, fabric discoloration, and chlorine retention obtained with dimethylol ethylene urea finishes on cotton under different conditions of application are given. The application conditions are varied with respect to curing temperature, catalyst employed and by inclusion and omission of a neutralizing wash after curing. The curing time is held constant at one minute to approximate high production speeds in practice. The results include data on chlorine retention damage before and after 10 launderings in soap and soda ash at 140°F.

INTRODUCTION

THE problem of damage from chlorine retention with nitrogen-containing-type crease-resistant finishes varies in severity with the type of fabric and the intended end use. The more critical problems are encountered with garments made from cotton fabrics which may be washed either in commercial laundries or at home. Garments sent to the commercial laundry must be constructed of fabrics which not only are resistant to damage from chlorine retention in the finished state, but in addition, retain this property after alkaline washing at high temperatures and after acid souring. Garments which are washed at home should be made from fabrics which are resistant to chlorine-retention damage after repeated alkaline washing, but the finish on these fabrics is not required to be stable to acid souring. Since the nitrogen-containing-type resins in commercial use are not completely resistant to acid hydrolysis, they should not be used in the finishing of fabrics which will be subjected to repeated commercial laundering.

The principal objective of this work was to obtain improved finishes on cotton with dimethylol ethylene urea (DMEU), which would show no chlorine-retention damage after repeated home launderings and bleaching. This objective must be accomplished while maintaining a high degree of crease resistance and at the same time maintaining acceptable fabric tensile strength and whiteness retention. DMEU has shown considerable promise of meeting this objective where alkaline laundering without souring is practiced.

DMEU-reactant resin has been used widely since its introduction to the textile trade, about 1948, in obtaining crease-resistant and dimensionally stable finishes on cotton. This chemical has been used extensively in the development of the increasingly popular "wash and wear" cotton garments. A number of papers describing the utility and properties of reactant finishing agents of this type have been published. The current state of the art is well covered by References 1, 2, and 3, although this is by no means a complete list.

An outstanding feature of DMEU finishes, when properly applied, is their good resistance to damage from chlorine retention. It is recognized that the catalyst system and processing conditions employed do have a pronounced effect on this property. Currently, there is much interest in the resistance to chlorine-retention damage of treated cotton fabrics after extended laundering.

METHOD OF ATTACK

The extent of chlorine retention damage depends on several variables:

1) Preparation of fabric
2) Selection of catalyst
3) Curing time
4) Curing temperature
5) Neutralization wash.

The first four variables determine the completeness of the curing reaction. An alkaline fabric will neutralize the acid catalyst. Therefore, a carefully prepared fabric was selected to avoid alkalinity. The catalyst should be selected for maximum activity without damage to the fabric. The catalysts were selected to obtain increasing activity, believed to be in the following order: alkylol amine, hydrochloride, magnesium chloride, zinc nitrate. The curing time and temperature have a very considerable effect on catalyst activity. A curing time of one minute was selected to approximate high speeds in mill production. A temperature range was used to determine the optimum curing temperature for the various catalysts in a one-minute cure. The effect of a neutralizing wash was studied to establish its importance.

* Presented by Osborne C Bacon during the 36th Annual AATCC Convention on November 14, 1957 at the Hotel Statler, Boston, Mass.

EXPERIMENTAL

The reactant-type finish used was 50% dimethylol ethylene urea containing approximately 1.5% free formaldehyde. The catalysts used were reagent grades of magnesium chloride hexahydrate and zinc nitrate hexahydrate, and an aqueous solution of 40% alkylol amine hydrochloride having 10% of the amine unneutralized. Henceforth, the catalysts will be referred to as $MgCl_2$, $Zn(NO_3)_2$, and Amine HCl, respectively. The fabric employed was a 2.85 yard per pound 80 x 80 cotton sheeting. This fabric was prepared by kier boiling, bleaching, and rinsing free of chemicals to provide an absorbent neutral material.

The method used for measuring damage from retained chlorine was a modification of the method given in the 1956 edition of the *AATCC Year Book*. The modifications consisted of: a) using distilled water throughout the test, including rinsing, b) omitting the prewetting step since all test fabrics were very absorbent, and c) air drying at room temperature prior to conditioning before scorching.

Crease recovery angles were determined by AATCC Tentative Test Method 66-56 and tensile strength was measured on a Scott Tester by the ravelled-strip method. Fabric whiteness was measured at 400 mμ with a G E Spectrophotometer calibrated in percent relative to magnesium oxide.

The DMEU was applied at 4% on the fabric weight from an aqueous bath containing 4% DMEU, 0.05% glacial acetic acid and 1.2% (on the weight of the bath) of one of the following catalysts:

a) Amine HCl (40% commercial product)
b) $MgCl_2 \cdot 6H_2O$
c) $Zn(NO_3)_2 \cdot 6H_2O$.

The acetic acid was added to the baths containing metal salt catalysts to eliminate the possibility of alkaline precipitation, whereas its addition to the bath containing the Amine HCl catalyst was merely for the sake of uniformity. The fabric was treated by padding at 80° F, 2 dips and 2 nips to apply an equal weight of the bath, followed by air drying at room temperature and curing in an oven with forced hot air circulation for one minute at the indicated temperatures. Half of the cured fabrics were given a 5-minute neutralizing hand wash at 110° F in a solution containing 0.05% alcohol sulfate detergent and 0.1% soda ash. The fabric was thoroughly rinsed, line dried and pressed flat.

Simulated home laundry tests were carried out in a 24-inch horizontal cylindrical reversing washer using 0.1% tallow chip soap and 0.05% soda ash at 140° F for 15 minutes. The washload was made up to 3 lb with clean cotton fabric. The rinsing was done in the machine and was followed by centrifugal extraction of the water. The test fabrics were tumble dried after each wash in a home-type dryer except after the last wash when the fabrics were dried by ironing.

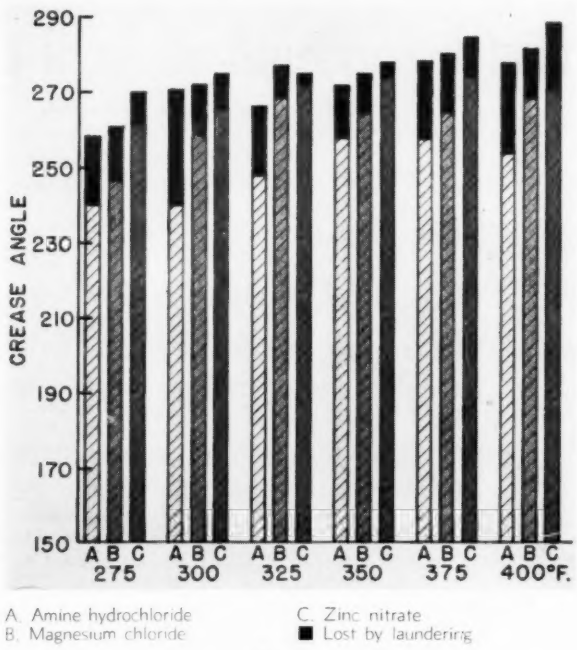

Figure 1

Effect of catalyst, curing temperature and ten launderings on crease recovery over untreated control (150°) (warp plus filling)

RESULTS

Data on the effect of catalyst type and curing temperature on crease resistance and fabric discoloration are given in Figures 1 and 2. The bar chart in Figure 1 shows crease recovery expressed in degrees as the sum of warp and filling tested separately. Fabric whiteness is given in Figure 2 in percent reflectivity relative to magnesium oxide.

The effects on tensile strength due to treatment, damage from bleaching and scorching after treatment, and damage from bleaching and scorching

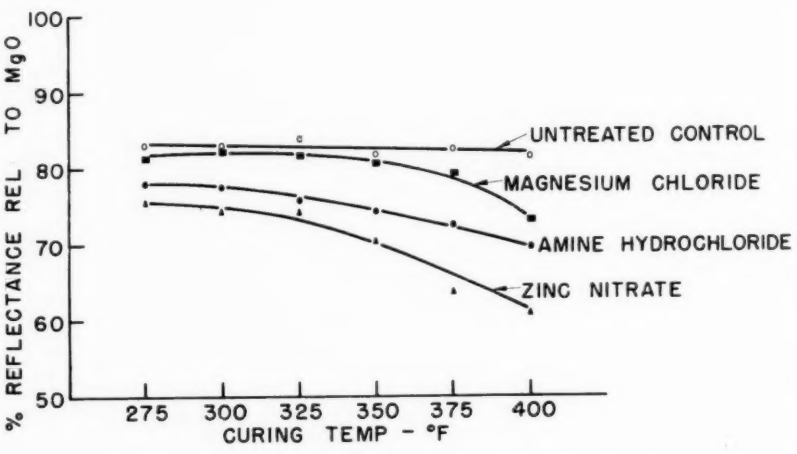

Figure 2

Effect of catalyst and temperature on fabric reflectance at 400 mμ wavelength

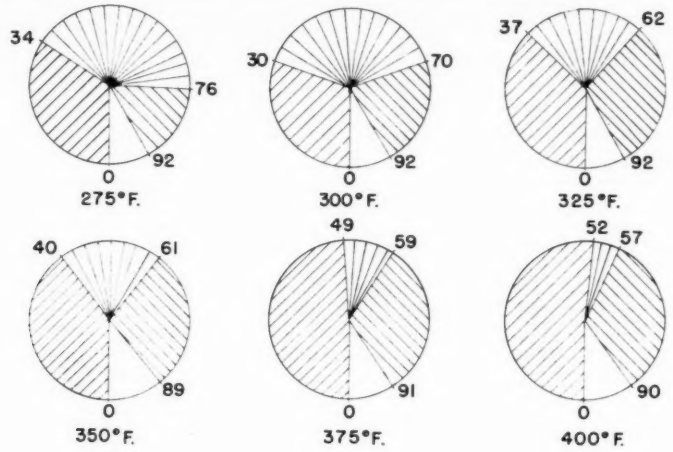

Figure 3
Amine hydrochloride (not neutralized)

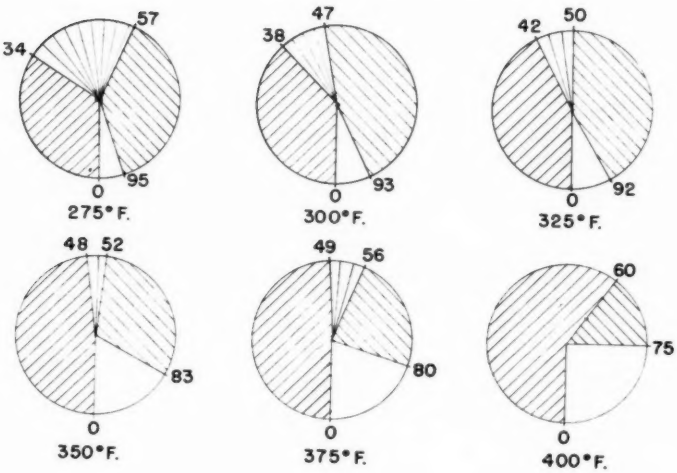

Figure 4
Magnesium chloride (not neutralized)

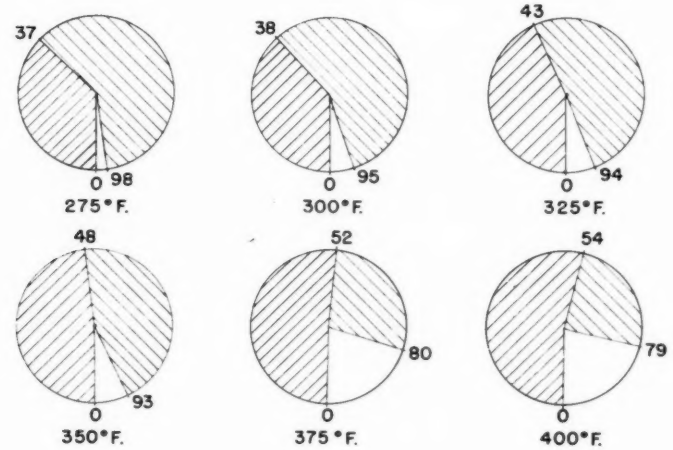

Figure 5
Zinc nitrate (not neutralized)

after treatment and 10 launderings are presented in pie chart form in Figures 3-8[1]. The first three sections shown represent percent cumulative damage beginning at 6 o'clock as zero and progressing clockwise. The different sections of the pie charts represent the following:

a) The first section is the loss in tensile strength caused by application of the finish. It is worth noting that laboratory applications result in more damage than mill applications in most instances. It may, therefore, be assumed that the values in this paper are high. Experience has indicated that a 50% loss in the laboratory would be 35% to 40% in a mill run. However, this should not be taken as true for all conditions and equipment.

b) The second section represents the additional loss obtained on subjecting the treated fabric to the chlorine-retention test.

c) The third section represents the portion of the chlorine-retention damage which is brought about by laundering.

d) The combined second and third sections represent the loss obtained after laundering the treated fabric ten times and then subjecting the fabric to the chlorine-retention test after the tenth laundering.

e) The fourth and last section represents the residual strength of the fabric after treatment, laundering, and subjection to the chlorine-retention test.

In the construction of the pie charts, the percent figures at the end of each section were obtained by the following formula:

$$\frac{\text{Original Strength—Resultant Strength}}{\text{Original Strength}} \times 100$$

The tensile strengths used in the calculations were the sum of warp plus filling. The original strength of the fabric was 100 pounds.

DISCUSSION

The data show that the curing temperature and catalyst do not have a strong bearing on crease resistance before or after laundering. However, the temperature and catalyst employed do have an effect on whiteness retention of the treated fabric. The data presented in the charts show that damage from retained chlorine with DMEU can be eliminated, even after ten home launderings, by proper application. For a particular fabric and curing time, the major factors in application affecting chlorine retention are:

[1]With the fabric and finishes used in this work, the bleaching step alone caused no change in tensile strength of treated fabric. All losses from chlorine retention occurred in the subsequent scorching step.

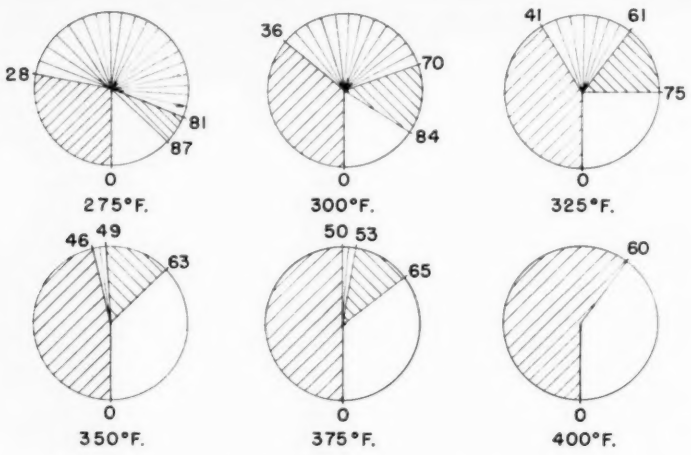

Figure 6
Amine hydrochloride (neutralized)

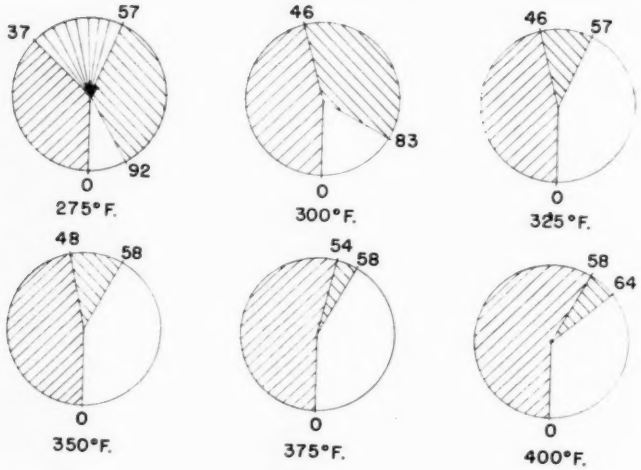

Figure 7
Magnesium chloride (neutralized)

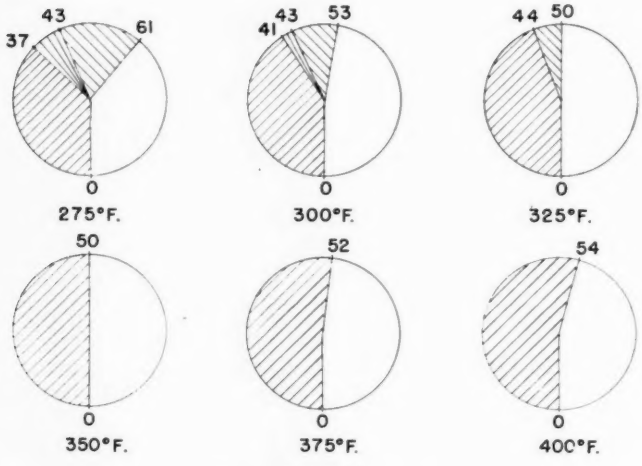

Figure 8
Zinc nitrate (neutralized)

1) Neutralization after curing,
2) Selection of the catalyst,
3) The curing temperature.

The data in Figure 1 show the effects of catalyst and curing temperature on crease resistance, initially and after repeated laundering. An excellent degree of crease resistance was obtained by using any of the three catalysts and it was only slightly reduced by laundering. While differences in the crease-angle recovery were observed with variations in curing temperature and catalyst type, they were not sufficiently great to make this property a deciding factor in catalyst and curing temperature selection.

The effects of catalyst and curing temperature on whiteness retention, as measured by fabric reflectance, are shown in Figure 2. The curve for the untreated control shows that heating at temperatures of 275° to 400° F does not cause discoloration. The application of DMEU results in varying degrees of discoloration which are related to the catalyst and temperature employed. The discoloration with $MgCl_2$ is only slight at temperatures up to 350° F. The Amine HCl catalyst shows appreciably more discoloration than $MgCl_2$ but appreciably less than $Zn(NO_3)_2$. In order to obtain an acceptable white, temperatures above 350° F should be avoided for Amine HCl and $Zn(NO_3)_2$, while a temperature of 375° F should be acceptable for $MgCl_2$. These data show that fabric color places a restriction on the temperature range that can be employed with each catalyst.

It is evident from Figures 3-8 that washing to neutralize the treated fabric after curing is a must if the potential of severe chlorine-retention damage after laundering and bleaching is to be eliminated. It is evident in Figures 4 and 5 that applications of DMEU can be made to obtain fabrics which initially show no potential to damage from chlorine retained after bleaching, even though the neutralizing step is omitted. However, these same unneutralized fabrics show a high potential to damage from retained chlorine after repeated laundering. The data obtained by the accelerated chlorine-retention test employed indicate that it is hazardous to omit the neutralizing step when the fabric end use requires a high degree of resistance to chlorine retention damage after laundering.

The beneficial effects of proper selection of catalyst and curing temperature on chlorine-retention properties with neutralized treatments are

(Concluded on page 272)

CHEMICAL TRENDS IN THE TEXTILE INDUSTRY*

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The textile industry is currently consuming about 2.3 billion dollars worth of chemicals annually, and there is every indication that this volume will increase in future years. Indeed, it has been stated frequently that the field of textiles constitutes the most promising area for expansion of the chemical industry in the forthcoming years.

In spite of such bright prospects, the problems and competition in the development of these markets are great, and success will depend in an overwhelming way on the efforts and skill of the chemical industry itself. A principal reason for this is found in the fact that the textile industry is primarily a mechanical industry whose predominant skill is in the area of construction. While it recognizes the need and importance of chemical products and processes, it shows little loyalty to any of these.

For the most part, the chemical industry has already assumed the responsibility for leadership in this area. Nonetheless, progress could be greatly accelerated by closer cooperation and coordination between these two industries.

CHEMICAL trends in the textile industry—what's ahead? This is the sort of question that has always been asked by a very forward-looking individual, company, or industry. But from the point of view of the chemical industry, the question now takes on unusual significance, and what makes it more vital and at the same time more difficult to answer than at any time in recent years are two paradoxical facts. First, during the past few years this country as a whole, and the chemical industry in particular, have enjoyed the greatest productivity, volume of business and prosperity the world has ever known—at the same time, competition for this enormous amount of business is at such an all-time high that many large organizations have either failed or suffered greatly. Second, industry as a whole is supporting an unprecedented amount of research, which is resulting in the development of an enormous array of new processes—at the same time, these developments are resulting in costly obsolescence.

The over-all answer to "what's ahead?" is, without doubt, growth and expansion—the only course there can be with expanding populations, rise in the standard of living, and sufficient productive capacity. But behind such a favorable prediction lie many unanswered questions as complex as any that have confronted any industry, and one of the most perplexing, from the point of view of the chemical industry, is what is required to share in this potential growth and especially in the gigantic market of chemicals for textiles. This, in short, might be considered the theme of this discussion.

At the outset, it may be well to remind ourselves of a few pertinent facts regarding the relationships between the textile and chemical industries. The textile industry is frequently referred to as the chemical industry's Number One customer. Little wonder, when we realize that this industry is now consuming chemicals at the rate of nearly 2.5 billion dollars annually and there is every indication that this volume will continue to grow. True, synthetic fibers account for over 80 percent of this volume, but nonetheless, the markets for processing chemicals are very large, indeed. Chemicals play an important part in every phase of the textile industry and include everything from fertilizers and insecticides used in growing fibers to an enormous number of processing chemicals, monomers, and polymers for synthetic fiber production, dyes, and finishing agents. Conversely, one can say that there is scarcely a segment of the chemical industry that is not reached by textiles.

In this discussion, however, I do not propose to present you with a lot of production statistics, charts, or graphs dealing with consumption of chemicals by the textile industry, nor do I propose to indulge in any crystal-gazing and tell you what will or will not be consumed in the future. For those of you who are interested in such data, I refer you to two excellent condensations of a symposium on this very subject, which was sponsored by the American Chemical Society this past spring. The articles appeared in the July 29 and August 5 issues of *Chemical and Engineering News* and covered such topics as chemicals for synthetic and regenerated fibers, chemical modification of natural fibers, surface-active agents, textile-processing chemicals, dyes, and finishing chemicals.

Returning again to the over-all picture, one is staggered by such estimates that the textile industry consumes over one pound of chemicals for each pound of fiber which ultimately reaches the consumer, and when one considers further that over 7 billion pounds of fiber are consumed annually in this country alone, the great stakes which confront the chemical industry are readily apparent.

Still another way of gaining a perspective of these markets is to consider all fibers, whether they be natural or synthetic, as chemical raw materials. When this is done, one finds that the dollar value of these exceeds the combined total dollar value of all the aliphatic and aromatic chemicals, plastics, motor-fuel additives and lubricants now produced by the chemical industry. This again only serves to emphasize the great potential for expansion of the chemical industry through synthetic textiles and textile chemical developments alone. So great is the potential that there are many who feel that the textile industry is to be the greatest frontier for expansion of the chemical industry during the next 50 years.

With such a glowing picture, it would seem that we should all relax and perhaps go out and play golf. But, as I pointed out earlier, the problems are far more complicated, and, indeed, there is to be very little opportunity for relaxing or for real comfort for those who are to succeed in this field.

What are some of these problems? Perhaps the foremost is found in the very nature of the textile industry. Historically, it is primarily a mechanical industry whose roots are found in the very beginning of the Industrial Revolution—an industry which achieved a high degree of mechanical skill before many of our so-called modern industries even dreamed of existence. These earlier

*Presented during the 36th Annual AATCC Convention on November 15, 1957 at the Hotel Statler, Boston, Mass.

companies were concerned only with the natural fibers; they were primarily single-purpose companies and almost solely dedicated to either cotton or wool or silk. With such concentration of effort and experience, they developed incredible mechanical skills and know-how, but only in very limited fields.

In contrast with these great mechanical skills, chemical knowledge was meager. Chemistry, as such, was limited to simple cleansing, dyeing, and finishing operations, with each company thinking it had many secret formulae, when, actually, most of them were widely known.

With the development of the synthetic dyes came many chemical advances of great importance to the textile industry, but from the very start the major portion of research and development, as well as servicing and trouble-shooting, has been provided by the chemical companies or textile chemical specialty houses. This has been equally true in the developments of both textile chemicals and synthetic fibers. A few larger textile firms made attempts at the development of their own modest research laboratories (modest by standards of other industries), but the number and size of these have appreciably diminished in recent years.

It is apparent from the foregoing that the textile industry is now relying more and more on the chemical industry for costly chemical research and development, as well as for service. At the same time, there is little loyalty to any fiber or to any textile chemical, and, more than ever before, those who hope to share in any phase of this gigantic market must be prepared to service this industry literally from the "cradle to the grave."

I suppose the word "grave" sounds very ominous, especially in an era when so many companies have either failed or closed their doors. What is meant, of course, is something very different. In most types of businesses, once a sale is completed, the company is through, with the exception of an occasional complaint in the case of faulty merchandise, or where minor servicing is required. Not so in our industry, and, actually, that is where the problems and expenses really arise. For example, the producer of the synthetic fiber or textile chemical has learned in a costly way that if something goes wrong in any one of the many processes involved in ordinary textile manufacturing—carding, combing, spinning, weaving, knitting, dyeing, or finishing, it is the new fiber or new finish which bears the brunt of the complaint. Completely overlooked is the fact that the machinery or processes being used or replaced were actually developed through long empirical experience for some other fiber or process with radically different characteristics. In a real sense, therefore, the producer of the synthetic fiber or finish must assume the responsibility for every step in the processing.

One can go even further. In many cases the producer has had to assume the responsibility for a large portion of the actual end-use development, whether it be yarn, fabric, or even garment, and finally he has also had to assume a large portion of the burden of even more costly promotion and advertising to the ultimate consumer. I venture that far more money is being expended today in end-use development, servicing, and promotion than has ever been spent or even envisaged in connection with the original development of any of the synthetic fibers or finishes.

I should hasten to add at this point that the chemical industry has always received a big assist from the technologists in the textile industry, but nonetheless, it has nearly always had to assume the initiative and much of the cost.

Such efforts have indeed resulted in the development of an enormous number of new clothing and industrial fabrics, as well as in a great variety of new functional finishes. From many points of view, however, these advances have been painfully slow. They have been slow because the manufacture of textiles involves many variables, and solutions are not easily approached in a direct manner. In addition, the industry produces tens of thousands of end-items, ranging from delicate clothing fabrics to rugged industrial materials, and the requirements of each in terms of fiber properties or finish are not easy to define. At the same time, the properties of our fibers and chemicals vary widely, each characterized by properties which may be very advantageous or disadvantageous, depending on the end-use to which it is put. In most cases it has proved time-consuming and costly to bring together the proper fiber or finish and end-use requirement. Nylon was fortunate in finding the hosiery market relatively quickly. Later, many other markets were developed, but it should not be forgotten that many failures, such as the nylon shirt, are strewn along the way. The acrylics are doing well, among other things in knit goods, the polyesters in blends with wool and cotton, but the roads to all of these successes proved rocky, indeed. Final success in each case was achieved only when the superb technical knowledge that resulted in the creation and development of new fibers or finishes was augmented with all the know-how relating to processing and fabric structure of a complex and basically mechanical industry.

The same has been true in the field of chemical finishing. The chemist has developed an enormous array of chemicals which can overcome many of the deficiencies of the different fiber types and alter the properties of a fabric in many different and desirable ways. But the problem of bringing the proper finish to the proper fabric construction has again greatly slowed progress in this important field. The ultimate, of course, is to utilize the best of both fabric construction and chemical finish. However, the importance of fabric construction alone to the successful use of a chemical finish cannot be over-emphasized. It can be said, for example, that a relatively poor water-repellent, crease-proofing, or stabilizing finish on an optimum fabric construction produces a far more satisfactory consumer item than one made with the best chemical finish yet devised, when applied to a very improperly designed fabric.

It has been the purpose of this discussion to point out a few of the problems which confront the chemical industry in attempting to reach the "pot of gold" at the rainbow's end. In the main, I have tried to emphasize that chemical skill alone is not sufficient to capture these markets. Somehow it must be integrated with the know-how of complex processing and even more complex fabric construction or geometry. I am sure that the relatively small number of technologists in the textile industry will lend valuable assistance, but this is not sufficient for the rate of progress now demanded by the producers of fibers or processing chemicals and finishes. It is doubtful whether much more assistance can be expected from many phases of the textile industry, especially where capital investment and costs are high and profits low. Finally, it must be remembered that these same firms are being wooed by every producer of natural and synthetic fibers, as well as by producers of all types of chemicals, and are in a position to demand every type of development aid and service.

In a broad sense, then, the chemical industry must literally be prepared to "go it alone." Many producers have already recognized this and are preparing to broaden their technical skills to an even greater extent, to include areas beyond their natural chemical skills. The gambles are great and the competition will be keen, but the stakes are even greater.

36th Annual Convention———

RESEARCH AND THE FUTURE OF THE TEXTILE INDUSTRY*

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Textile concerns will be faced with rigorous competition and narrow profit margins in the next few years. The textile industry is faced with rising wage rates due to increased unionization and the general rise in level of wages in the economy. Raw material prices have risen as a result of government price supports, and foreign competition has increased as import duties have been lowered.

During the war years capacity was expanded to meet increased demand, and during peacetime there is a process of readjustment of demand. This readjustment period has been intensified by improvements in equipment and changes in the useful life of garments and the purchasing habits of consumers. There appears to be no immediate prospect of industry-wide relief based on demand overtaking capacity.

In the near future the number of companies in the field will be reduced, and the survivors will be those who can combine technological skill with sound business practices.

WE all know that there are certain impossibilities that man faces in his civilized life. He cannot escape age, or taxes, or the constant need to feed and clothe himself.

Each generation is presented with a list of impossibilities by the last, and faces the challenge of the many things that supposedly "cannot be done."

Interestingly enough, the list grows shorter with each passing generation, and as inquisitive and ingenious man matures in the world around him, he can take inventory of the countless impossibilities that he has crossed from his list.

Man harnessed the lightning bolt and turned night into day.

He contained the vapors of boiling water and put steam to work for his own uses.

He fashioned wood and fabric wings and learned to fly.

One scientist earlier in this century made a silk purse from a sow's ear —not for commercial reasons, but to prove that it was possible. His name? Arthur D Little.

Today man is poised on the fringe of outer space, ready to leap into the uncharted areas of our universe. Each signal from the tiny satellites that circle the earth above us mocks the man who said it couldn't be done.

In this day when scientific tools can be brought to bear on almost any problem of life, commerce, or industry, I for one would think twice before endorsing any popular impossibility or pessimistic axiom.

One, for example, is that nothing can be done to save the American textile industry.

Let's face it, the economic outlook for the textile industry cannot, in all candor, be called rosy.

It has been faced with rising wage rates since before World War II. Some of the increases have undoubtedly resulted from increasing unionization of textile workers, but it must be recognized that wage rates for textile workers also would have risen as the general level of wages in the economy has increased. Since the textile industry competes with other industries for labor, it must pay competitive wages for comparable skills. Unfortunately, the textile industry is less able to pass increased wage costs along to customers than are those industries where the impetus for general wage increases has originated.

The textile industry is in a difficult position in regard to its raw material. The industry largely buys in controlled or less competitive markets and then sells its manufactured goods in highly competitive markets. For example, the price of raw cotton has been, and still is, supported by the U S Government. Price support, for a so-called basic commodity like cotton, is maintained at a predetermined percentage of parity (the percentage being determined by Congress). Parity is based on the 1910-1914 relationship between prices for cotton and prices of certain manufactured products. Thus, as inflation has raised the prices paid by farmers, the parity price for cotton in the United States has been increased far above world prices for cotton. As in the case of wages, textile producers have had difficulty in passing increased raw material costs on the customers through price increases. Where natural fibers are concerned, the textile industry has largely lost its export markets and has become increasingly susceptible to imports because it pays a supported price for raw materials while its foreign competitors enjoy lower world prices. Because of the strength of the farm lobby, only supreme pressure by the textile industry can convince Congress that price supports for cotton should be done away.

Prices of synthetic fibers have been established by one or a limited number of major producers of such fibers under competitive conditions which permit maintenance of administered prices. The conditions for entrance into the synthetic fiber field are such that it is unlikely that this part of the textile industry will become as competitive as the spinning, weaving, finishing, and converting segments of the textile industry.

Most recent Government actions in the tariff field affecting the textile industry have been directed toward lowering import duties rather than providing protection for domestic producers based on wage differentials in the U S and foreign countries and on differences in raw material costs because of support programs or national defense considerations. As a result, the competitive position of the U S textile industry in its domestic markets has suffered. The industry, therefore, must get action on tariffs if it is to have relief from this situation.

The present instability of the textile industry has its source in the effects on the industry of World Wars I and II. During the first war, and immediately afterwards, average prices in the textile industry increased nearly four-fold for woolens and worsteds. This encouraged a substantial expansion in production capacity.

Since the post-World War I depression of 1921, the textile industry has had few years of really profitable operation, except during World War II and the Korean War. A long period of adjustment in the textile industry, which began in earnest in 1928, was interrupted by World War II. During World War II, defense orders resulted in an increase in the number of hours operation per

*Presented during the 36th Annual AATCC Convention on November 15, 1957 at the Hotel Statler, Boston, Mass.

spindle and increased earnings. Much equipment was continued in operation that might otherwise have been junked, and a number of concerns were encouraged to believe that hard times were over for the textile industry.

Immediately following the end of the war, deferred civilian demand for textiles permitted the continuation of multiple-shift operation; and with the relaxation of price control, profits soared. However, once the deferred civilian demands from the war years were satisfied, another period of adjustment of capacity began. This process of adjustment of capacity to demand was again briefly interrupted by the Korean War. Called upon during national emergencies to supply essential defense demand, the textile industry pays for any profits made during these periods by a painful process of readjustment to normal peace time demands for its product.

At the present time, numerous textile operators have been comparing population growth statistics with the number of active spindles and trying to convince themselves that soon the problem of excess capacity will disappear because of population growth. Undoubtedly, some concerns have established a goal of keeping out of bankruptcy until this time arrives.

This question of market growth and number of customers and productive capacity merits careful study. Frequently the analysis is made on the basis of the number of active spindles. It should be pointed out that, between 1930 and 1939, the average number of active spindles decreased from 27 million to 22 million. However, as a result of improvements in equipment and an increase in the average number of hours of operation per spindle, production of cotton textiles increased over the same period from six and one-half billion square yards to nine billion square yards. In 1955, there were 19 million active spindles consuming cotton only, while production in square yards had increased still further to nearly 11 billion. Changes in the useful life of garments and in purchasing habits of consumers which affect per capita consumption of textiles also have to be taken into account. There appears to be no immediate prospect of industry-wide relief based on demand overtaking capacity.

Thus, an analysis of wage, raw material, tariff, and excess capacity problems shows that there will continue to be unsatisfactory earnings or actual losses in the textile industry during the next few years. It also is likely that there will be a continuation of mergers, acquisition, and failures which will reduce the number of major establishments in the textile industry.

There is the problem—the basis for the impossibility.

Does it mean that individual companies within the industry will not or cannot prosper? It should not! A number of companies have a long record of profitable operation in their segment of the industry. To some degree this has been based on achieving lower cost operation than their competitors. On the whole though, it has not been a question of doing what everyone else is doing—only a little better. Rather, it has meant specializing in a particular product field and, through market research and development, producing and marketing products that the public wants and accepts.

Three examples of profitable operation in the textile industry are Cluett Peabody, which, although it lost its patent position for the compressive shrinkage process, made further research on shrinkage to gain additional patent advantages. This company, which has paid dividends every year since 1923, has expanded and modernized its plants and has emphasized larger sales volume in its manufacturing division.

Johnson & Johnson, a pioneer in new products, introduced 10 new products during 1956 and has added extensive manufacturing facilities. This company has maintained and improved its position through its research effort.

The Kendall Company, for example, has great strength in market diversification and lack of dependence on any one trade or outlet. Its research effort has led it into the polyethylene field where it expects to find considerable business. Its new finishing plant in South Carolina and modernization of spinning and weaving plants have made it more competitive and given it more opportunities for profitable growth.

Other companies have absorbed or merged with their competitors in a particular segment of the industry to the point that capacity is appropriate to the level of demand for the products. Still other companies have diversified into other aspects of the textile field to reduce their dependence on textile production operations.

There is the inkling of what the textile industry can do about its "impossible" task.

First of all, the industry must avail itself of all the tools of modern industrial research, in all its fully developed, wide-coverage aspects.

It has been historically one of the most progressive industries in its technology. Working closely with the chemical and other industries it has created new fabrics, new methods, and new machinery.

Orlon, Dacron, nylon, Acrilan and others are magic words that have been added to man's vocabulary. What of the new coated fabrics, water-repellent fabrics, crease-resistant fabrics, shrink-proof fabrics? All these are testimony to the scientific skill of the American textile industry.

Yet technical advances alone cannot help the textile industry fight back and regain a sound position in the face of oppressive operating costs and foreign competition.

The industry must carry modern research techniques one step further into its higher councils, so that the objective and inquisitive eye of the research man can find ways to improve management's function, much as textile technology has been improved.

Modern industrial research can help management evaluate its products, weed out the inferior fabrics that hurt the industry, and coordinate and strengthen the production, promotion, and sales of the industry's superior products. It can help the industry prepare its case for more favorable Government legislation. It can guide the industry in diversification and integration moves.

It can assist the industry in its search for new products, fabrics, and techniques.

In today's fierce competition, research is no longer a specific function of one segment of a company's overall operation. It must be available to all levels of a company, and it must be used wisely.

Make no mistake. Research in itself is no panacea, no mystic snake oil that in prescribed doses will cure all the ills of an ailing industry.

Properly used, by basically sound companies, it should be able to offer hope of a selective prosperity in the textile industry.

Its efforts must be aided by proper legislation, by reasonable labor conditions, and most important, by a concerted desire and effort by all segments of the textile industry to meet its problems squarely and optimistically.

The textile company which, like Charlie Wilson's proverbial hound dog, sits on its tail and yelps, is, perhaps, doomed, for no company will survive if its management is convinced that survival is impossible.

The company that truly feels that it can survive, with a willingness to make full use of industrial research, with assistance through groups and associations of like-minded companies, can bring a new era of leadership and prosperity to the American Textile Industry.

36th Annual Convention———

WHAT AN ULTRAVIOLET REFLECTANCE CURVE CAN TELL ABOUT A TEXTILE MATERIAL

Part I—Fiber Identification*

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The ultraviolet reflectance characteristics of twenty different fibers have been determined. They are sufficiently different to serve not only as an aid in identification but also to determine the type of bleach used, presence or absence of a delustrant, effect of chemical treatment and finishes and the effect of heat and light.

INTRODUCTION

THIS paper is concerned mainly with an investigation of the reflectance of textile materials in the ultra violet (UV) region of the spectrum. Although the work reported herein deals primarily with fiber identification, the technique is by no means thus limited in scope, as will appear later.

Fiber dentficaton, as done today, usually calls for a combination of chemical and miscroscopical techniques. The analyst may first burn the sample and note the type of char and the odor given off and then, using another sample, test for chlorine and nitrogen. He may determine the melting point and submit other portions of the same sample to a series of solubility tests in various solvents. These chemical and physical tests together with a microscopical examination of the fiber cross section may be sufficient to identify the sample. However, the great variety of synthetic-fiber cross sections and the fact that sometimes the same chemical type of fiber may be made in several cross-sectional shapes makes the microscopist's work difficult.

Infra-red analysis would give quite complete information on the composition and structure of a fiber sample but the equipment can be quite expensive and the interpretation of the curves requires time, skill and experience. It is hoped that the information presented in this paper will not only aid the analyst in fiber identification but also serve as a useful tool in deriving further information with respect to the behavior of fibers and fabrics.

ADVANTAGE OF REFLECTANCE MEASUREMENTS

UV transmittance measurements are useful in determining molecular structure, but in the case of textile fibers it would first be necessary to get the material into solution, or, at least in the form of a thin transparent film. This would, of course, involve some difficulty from the point of view of obtaining such a solution without a coincidental chemical change or solvation effect which would alter the transmittance curve. It is obvious that such a step can be avoided by the use of a reflectance technique not requiring the physical destruction of the sample.

It is believed the UV reflectance characteristics are as much a fundamental property of the various textile fibers as tenacity, specific gravity, melting point, index of refraction, and the like, and can be equally useful. As such they should be recorded in the literature. Having established the basic shape of the UV reflectance curve for the various textile fibers, it should then be possible to detect and possibly identify various finishes and to determine the type of chemical treatment or effect or irradiation to which the material may have been subjected.

SAMPLES

All fiber samples were commerically available materials which were cleaned of any finish oils by extraction in a Soxhlet apparatus with carbon tetrachloride and allowed to dry at room temperature until free of solvent. The sample of fiber was then carded, rolled into a ball and flattened into a batt about ¼-inch thick and one inch in diameter. If the sample was a fabric, it was folded into a pad of about the same dimensions. To present a uniform fiber surface to the instrument, all samples were covered with a quartz plate about one millimeter thick. No correction was made for any losses in reflectance due to absorption by the quartz.

Experiments with fiber pads of increased density obtained by the use of an hydraulic press only raised the UV reflectance a small amount due to the reduction of light traps and did not change the basic shape of the reflectance curves. Similarly, it was found that variations in the filament denier of synthetic fibers did not affect the basic curve shape.

INSTRUMENTATION

A conventional Beckman DU Spectrophotometer equipped with a 1P28 photomultiplier detector tube and a standard Beckman reflectance attachment was used throughout the work. The percent reflectance was not measured in absolute units but with reference to a freshly scraped piece of magnesium carbonate.

EXPERIMENTAL

Figure 1 shows UV reflectance curves characteristic of four different commonly used cellulosic materials, ramie (unbleached), cotton (Delfos), viscose, and filter paper (Whatman #2).

These curves are characteristically different with respect to each other and to curves for other types of fibers to follow. Although the curves here presented are for fibers primarily of cellulose, due recognition must be given to binding materials, lignins, waxes, parenchema cells and naturally occurring pigments or coloring matter. The reflectance curves for cotton and ramie show characteristic plateaus in the region from about 240 to 280 millimicrons. On the other hand, those for the viscose and filter paper are essentially lacking in this plateau. It would appear, then, that

* Presented by George Thomson during the 36th Annual AATCC Convention on November 14th, 1957 at the Hotel Statler, Boston, Mass.

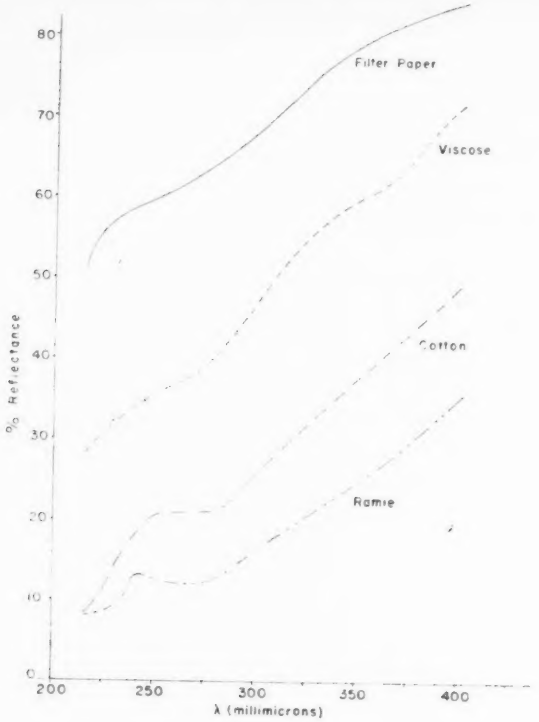

Figure 1

Ultraviolet reflectance of cellulosic fibers

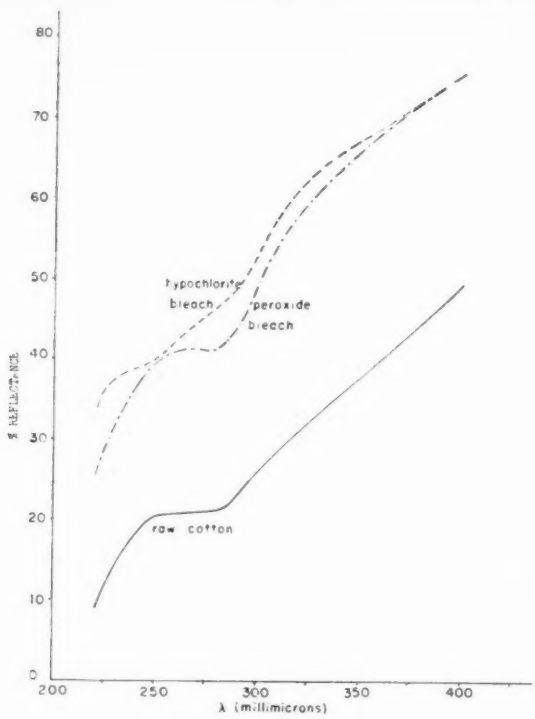

Figure 2

Effect of bleach on UV reflectance of cotton

any difference in the shape of the curves is indicative of chemical action having taken place, and that the two upper curves are those of cellulosic materials which have been modified somewhere in the processing of the fibers.

The possibility of chemical modification is perhaps best borne out by looking at Figure 2. This shows the effect of both chlorine (hypochlorite) and peroxide bleaching on samples of the same lot of natural cotton. The bottom curve is that of the unbleached cotton fiber. It will be noted that the peroxide bleach curve is essentially the same shape as that of the natural cotton, while in the case of the hypochlorite-bleached sample the plateau has been shifted to lower wavelengths and is not as pronounced. It is interesting to compare, for a moment, and note by reference again to Figure 1 that the curve for the chlorine-bleached cotton and that for the viscose are almost identical in shape. This suggests, then, that the curve for the viscose is perhaps not typical of the xanthation process, but more indicative of the way in which the pulp was bleached prior to the regeneration of the cellulose in the form of viscose fiber. Thus, it appears possible to determine rather easily which of these two types of bleach a cotton fabric has been subjected to.

In Figure 3, the curve for flax appears to have none of the characteristics of a curve for a cellulosic fiber. In fact, as will be seen later, it resembles more the curve for a protein fiber, such as Vicuña. This is probably due to the coloring matter since the curve for bleached linen is more typically cellulosic with a trace of a plateau in the same region as in the case of cotton and ramie.

The effect of chemical modification of cellulose is demonstrated in Figure 4 showing the reflectance curves of cellulose acetate, cellulose triacetate and a saponified cellulose acetate known as Fortisan. The lower curve is for the same cotton (Delfos) as shown in Figures 1 and 2 and is included here for purposes of comparison. Note that the plateau of the cotton curve is still present in the curves for the acetylated samples. The curves for the cellulose acetates indicate an increase in reflectance with increase in acetate content. By the same token, it might be expected that removal of these acetate groups would again lower the reflectance. Such is not the case. It should be remembered that in the UV region, gross changes in reflectance are a result, not of physical changes, but of changes in the chemical nature of the material. This being so, the higher reflectance and the different shape of the Fortisan curve suggests that perhaps there may be unsuspected cross linkages (ether type) in Fortisan. It is interesting to note in this respect that a reflectance curve for paraformaldehyde, high in ether linkages, is well up near the 100% reflectance level.

Figure 5 shows characteristic curves of several natural and regenerated proteins. The reflectance characteristics of these fibers, especially below 300 mμ, are considerably lower than those of the cellulosics, natural or regenerated, which have just been examined. Again, regeneration of the fiber does not seem to alter the overall protein curve shape. In other words, the curve is more characteristic of the protein material than of the source of the fiber. Even in the case of naturally pigmented protein fibers, the first part of the curve is still the same as that shown for wool, but from 300-400 mμ the curve stays very low as demonstrated by the Vicuña curve and is almost linear throughout the visible region depending on the pigment present.

Figure 6 shows curves characteristic of two types of nylon, the ordinary

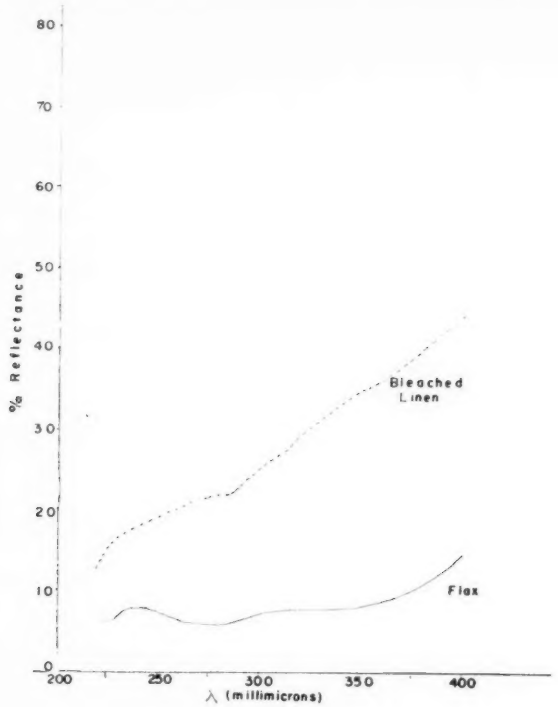

Figure 3
UV reflectance of flax and bleached linen

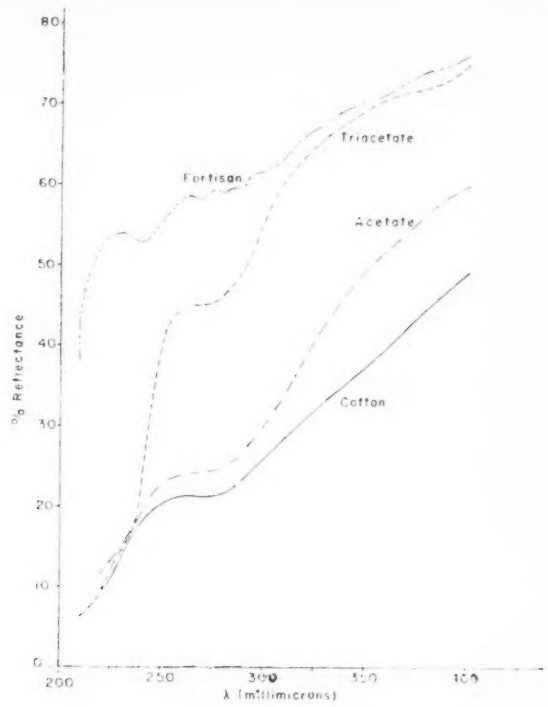

Figure 4
UV reflectance of cellulosic derivatives

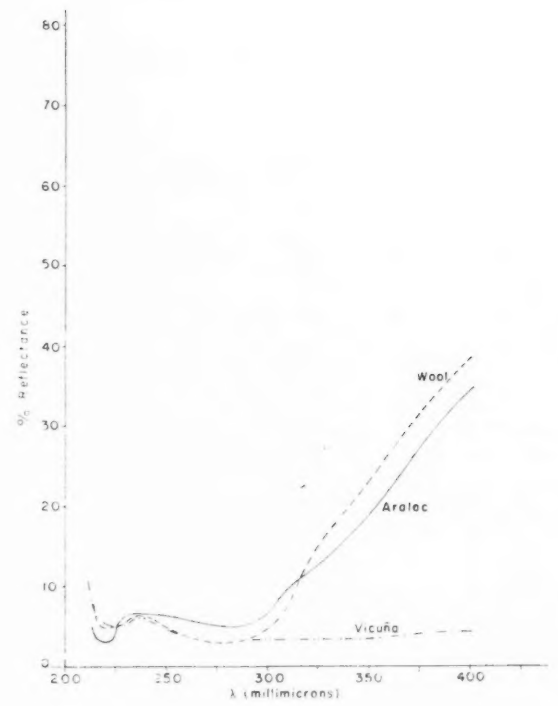

Figure 5
UV reflectance of protein fibers

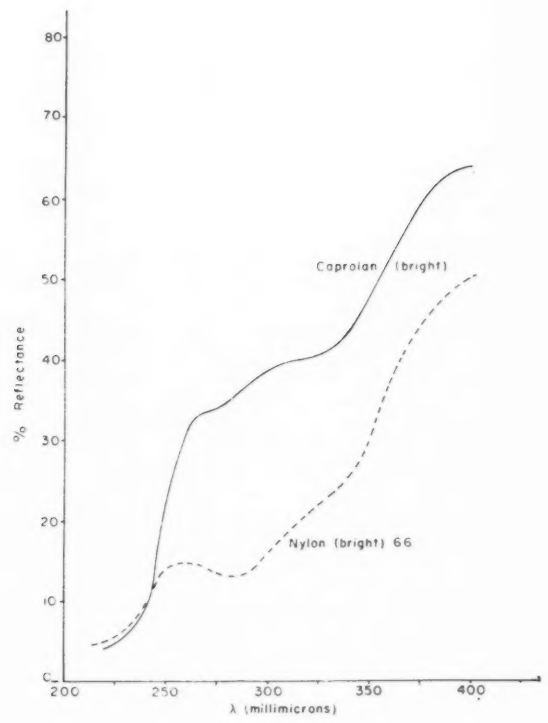

Figure 6
UV reflectance of polyamide fibers

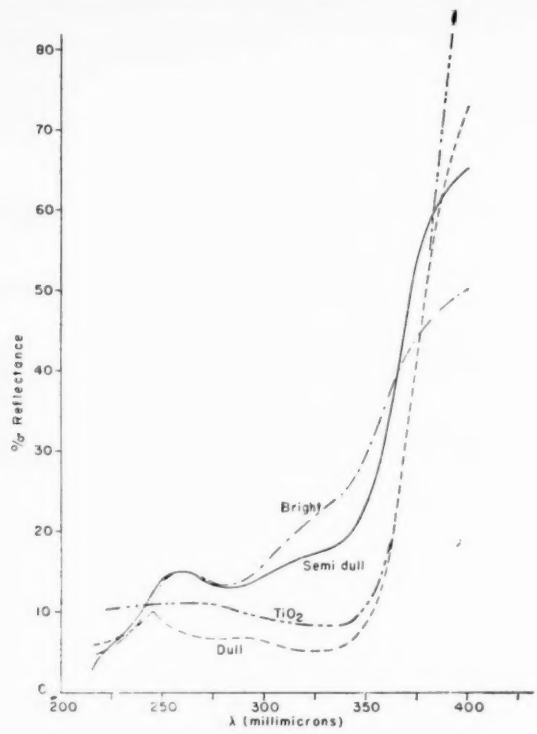

Figure 7
Effect of delustering on UV reflectance of nylon 66

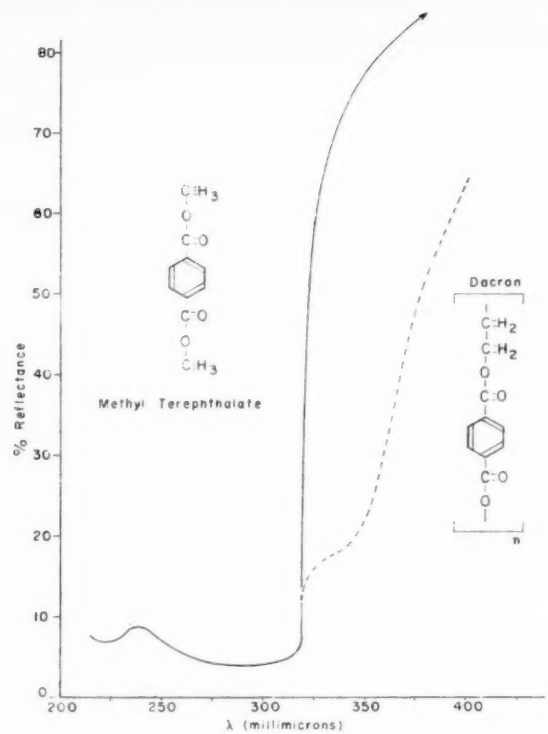

Figure 8
UV reflectance of terephthalates

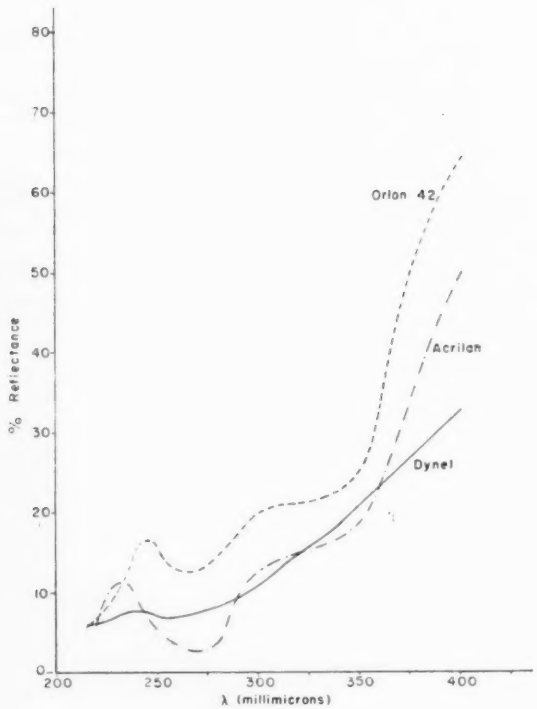

Figure 9
UV reflectance of acrylonitrile fibers

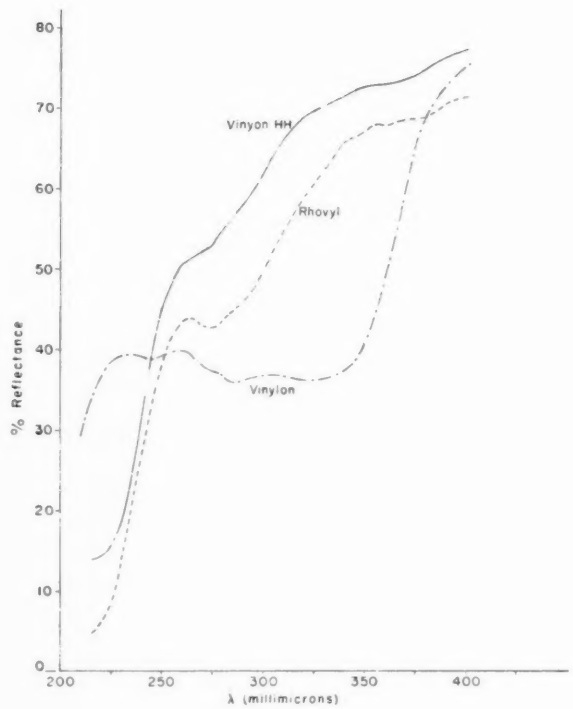

Figure 10
UV reflectance of vinyl fibers

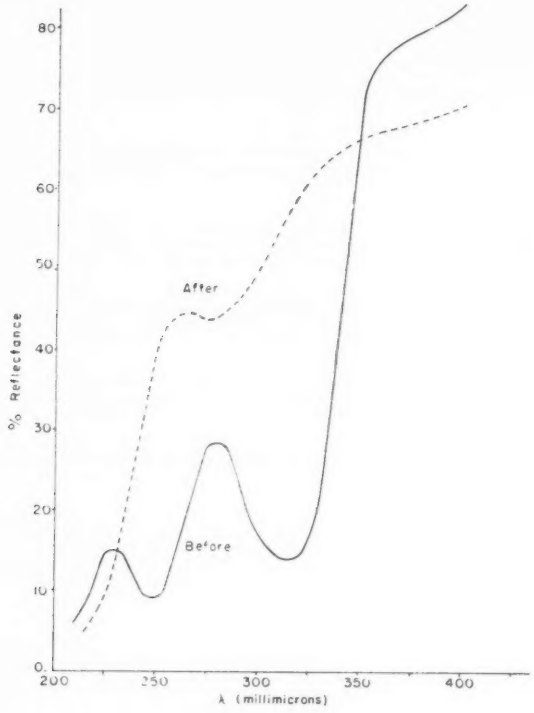

Figure 11

Effect of carbon tetrachloride on UV reflectance of Rhovyl fiber

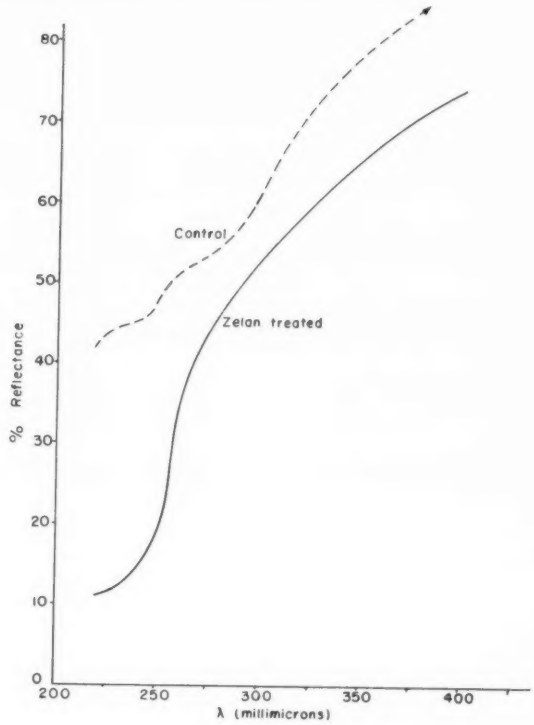

Figure 12

Effect of Zelan treatment on UV reflectance of starched cotton

type 66 and Caprolan, which is a caprolactam-base fiber, commonly called type 6 nylon. It will be noted that in the case of the type 66 nylon there is an absorption valley at approximately 285 millimicrons, while in the case of the type 6 the absorption valley in this region is not as pronounced and appears to be at a slightly lower wavelength. The resemblance of an absorption valley of about 330-340 mμ may be due to a trace of delustrant known to be present even in so-called bright fibers.

The effect of delustering is brought out in Figure 7 which shows three different types of nylon 66, bright, semidull and full dull. It will be noted that the presence of titanium dioxide introduces a new absorption valley in the nylon curve at about 340 millimicrons. This valley is characteristic of the titanium dioxide itself and, although the absorption for the titanium dioxide is approximately linear over the rest of the spectral region down to 200 mμ, the absorption of the nylon in the region below 260 mμ is sufficient to control the curve shape. These curves illustrate the well-known effect of delustering in increasing the UV susceptibility of nylon.

The curves shown in Figure 8 are characteristic of terephthalates. They are coincident up to 320 mμ, the dotted line being a continuation of that for Dacron and the solid line that for methyl terephthalate. The lower part of the curve appears therefore to be characteristic of the terephthalate grouping. The dotted portion of the Dacron curve is probably due to the effect of the ethylene groupings. It is by such identification of the various parts of these reflectance curves that it is hoped the nature of changes caused by chemicals or heat and light may be determined.

Figure 9 shows reflectance curves for various fibers made from acrylonitrile, the top curve representing Orlon 42, the next one Acrilan, and the lower solid curve that for Dynel. Dynel is not strictly an acrylonitrile, but a copolymer of 40% acrylonitrile and 60% vinyl chloride. The fact that it is a copolymer with such a high vinyl chloride content accounts for the fact that it is *least* like the curve for Orlon which is *primarily* acrylonitrile. The Acrilan contains small amounts of vinyl derivatives copolymerized with the acrylonitrile to make the fiber more easily dyeable. As in the case of the Dynel, it is probably the presence of these other vinyl derivatives in the polymer which accounts for the Acrilan having a lower reflectance with a slight shift in the absorption maximum in the 270-280 mμ region. Similar curves were obtained for other acrylonitrile-based fibers, such as Zefran and Creslan, which, although similar in shape, exhibited sufficient differences for fiber identification.

Figure 10 shows curves for three vinyl derivative fibers, Vinylon (cross-linked polyvinyl alcohol), Rhovyl (polyvinyl chloride), and Vinyon HH, a copolymer of vinyl chloride and vinyl acetate. As mentioned previously, all fibers were cleaned by means of a Sohxlet extraction using carbon tetrachloride. In the case of the Rhovyl fiber, it was slightly stiffer after being "cleaned" in this manner.

Figure 11 shows the effect of this cleaning on the reflectance curve. Evidently something was removed from the fiber. Whether this was a finish oil or a plasticizer or some other minor component has not been determined.

Figure 12 shows the effect of a Zelan treatment on cotton fabric containing a small amount of starch.

SUMMARY

In summary it would appear that each fiber type has its own characteristic UV reflectance curve, and thus, such reflectance curves can be used to a large extent as a quick (5-10 min) and easy means of fiber identification. Of course, this requires that all fibers to be evaluated have no dyestuffs on them or any extraneous finishes which would mask the basic fiber reflectance characteristics.

It is believed that UV reflectance curves such as have been shown here are as fundamental a property of the material being investigated as tenacity, density, index of refraction and the like and, as such, should be recorded in the literature.

It has been shown that it is not difficult to distinguish between two different types of bleaches which are commonly used on cellulosic fibers.

The effect of the delusterants such as titanium dioxide on nylon fibers has been determined. It might be mentioned here that this same general effect of titanium dioxide on the shape of the UV reflectance curve occurs in the dulling of other fibers such as cellulose acetate. The curves in themselves, also give a good index of the relative ultraviolet absorptions of the various fiber types.

Having established these characteristic basic curve shapes, it will now be possible to proceed with the evaluation of various chemical treatments and their effects upon the UV reflectance of various fibers. Further work on the use of this technique for the identification and evaluation of various types of finishes such as oils, starches, softeners, water repellents, optical bleaches, and of exposure to light and heat will be reported in future papers.

Effect of Laundering——

(concluded from page P262)

shown in Figures 6, 7 and 8. These charts show that $Zn(NO_3)_2$ is the preferred catalyst for eliminating chlorine retention. Zinc nitrate as a catalyst eliminates damage from chlorine retention of DMEU finishes on cotton using curing temperatures of 350° F or higher. The damage from chlorine retention using $Zn(NO_3)_2$ as a catalyst is slight when a curing temperature of 325° F is used. Actually, the total effect on tensile strength from treatment and/or damage from chlorine retention after ten launderings is about the same for curing temperatures over the range 300-375°F. While the temperature of 350°F assures elimination of damage from chlorine retention, it may be desirable in some instances to use a lower temperature, such as 325°F, in view of the increased yellowing which is encountered when using zinc nitrate as catalyst at higher temperatures.

Because of the better color which is obtained by its use, $MgCl_2$ may be a good second choice for obtaining finishes from DMEU which are resistant to damage by chlorine retention. Chlorine retention is not completely eliminated, however. A temperature of 375°F appears preferred for obtaining the lowest chlorine retention. If maintaining strength of fabric after treatment is considered to be more important than resistance to chlorine damage, temperatures as low as 325° F may be preferred.

Chlorine retention was not eliminated when using the amine HCl catalyst except at a curing temperature of 400°F where discoloration and tensile strength loss on treatment are bad. The metal salt catalysts are superior to the amine HCl for obtaining finishes resistant to degradation by bleaching and ironing.

SUMMARY

The conclusions from this work are:

1) Excellent resistance to damage from chlorine retention initially and after home laundering can be attained with dimethylol ethylene urea on cotton.

2) A neutralizing wash after curing is essential for the best resistance to chlorine damage, especially after laundering.

3) The optimum resistance to chlorine damage is obtained with zinc nitrate catalyst when curing 1 minute at 325° to 375° F, followed by a neutralizing wash.

4) Magnesium chloride catalyst is inferior to zinc nitrate but superior to the alkylol amine hydrochloride for producing resistance to chlorine retention damage.

5) The attainment of a durable crease-resistant finish is not a problem.

6) The discoloration of white fabric is least with magnesium chloride, greatest with zinc nitrate, and intermediate with the alkylol amine hydrochloride. The whiteness retention with zinc nitrate is best at the lower curing temperatures.

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(3) Williams, C R; *Am Dyestuff Reptr* **45**, No. 15, P472 (July 16, 1956).

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58-7

Education: Engineering College of Baghdad, Baghdad, Iraq, 1 year, sciences; Royal College of Pharmacy & Chemistry, Baghdad, Iraq, 4 years, BS, chemistry; New Bedford Institute of Technology, 2½ years, MS, textile chemistry.
Experience: 3 years petroleum chemist, private enterprise and government.
Age: 27; single; no dependents; references.
Position Desired: chemist in textiles and/or related fields; petroleum chemist.
Location Desired: open in USA or Middle East.
Present Occupation: Student.

4-7, 4-21

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Ernest R Kaswell (left), chairman of the 1957 AATCC Convention Committee, was presented with an illuminated scroll at a final report dinner meeting of the Convention Committee held on Friday, February 28th, at the MIT Endicott House in Dedham, Mass.

The presentation was made on behalf of the Convention Committee by Geo O Linberg, AATCC president. The scroll read in part "For generous and unselfish devotion to AATCC, humility and inspiration in leadership, cooperation at all times despite constant demands, patience, grace and humor in shouldering countless burdens and responsibilities, we the undersigned present this token of admiration, appreciation and friendship." The scroll was signed by:
E B Bell, R J Carey, R F Caroselli, E S Chapin, R E Derby, H X DeRedon, P S Durfee, J R Ericson, R R Frey, T J Gillick Jr, H M Gorton Jr, T Larson, G O Linberg, J E Lynn, A W Mack, G P Paine, R J Peirent, R B Taylorson, D H Thomas and F V Traut.

Mr Kaswell is a vice president of the Association representing the New England Region and is president of Fabric Research Laboratories, Inc, Dedham, Mass.

The following attended the dinner—Mr & Mrs H X DeRedon, Mr & Mrs P S Durfee, Mr & Mrs R R Frey, Mr & Mrs E R Kaswell, Mr & Mrs T Larson, Mr & Mrs G O Linberg, Mr & Mrs A W Mack, Mr & Mrs G P Paine, Mr R J Peirent and Mr & Mrs D H Thomas.

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Richard Norrell—Sales development rep, Eastman Chemical Products, Inc, Kingsport, Tenn. Sponsors: D G Hedberg Jr, W R Ivey Jr. (SC).

Sourene Ohanian—Partner & colorist, Craft Textile Printing Co, Inc, Paterson, NJ. Sponsors: K M Prytherch, O F Habel. (Met).

George Sellers—Package dyer, Mass Mohair Plush Co, Div Horvath Industries, Kings Mountain, NC. Sponsors: D B Norton, A F Haas. (P).

L Feltz Smith—Overseer, State of California Cotton Textile Mill, San Quentin, Calif. Sponsors: W R Brandt, D O Paulson. (PS).

C G Walker—Dyer, Rebel Dyeing Corp, Gloversville, NY. Sponsors: E A Chevrette, R I Moyer. (HM).

W B Woodall Jr—Dyer, Eagle & Phenix Div, Reeves Bros, Inc, Columbus, Ga. Sponsors: L Tigler, H J Gambert. (S).

W N Wright Jr—Chemist, Wm E Wright & Sons Co, West Warren, Mass. Sponsors: H F Weidman, E Collins. (WNE).

ASSOCIATE

Frank J Gall—Sales rep, chemicals, The Dow Chemical Co, Atlanta, Ga. (S).

JUNIOR

Norman Blackman—Color mixer, Allied Textile Printers Inc, Paterson, NJ. Sponsors: E G Frick, M Negro. (Met).

Kenneth Shear—Textile analyst, J Eisenberg Inc, New York, NY. Sponsors: H H Frede, G P Paine. (Met).

Raymond Savdie—Textile chemist, Industria Nacional de Tejidos "Sedalana", Bogota, Colombia. Sponsor: A W Grumberg.

PAPERS FOR 1958 CONVENTION

INDIVIDUALS and firms desiring to present papers at the AATCC Convention in Chicago, Oct 30-Nov 1, 1958 should send 100-200 word summaries to:

Leonard J Armstrong
Varney Chemical Corp
Janesville, Wisconsin

before May 15, 1958.

Papers should be of interest to a large segment of the textile industry. Oral presentation should be streamlined to a 20-minute delivery time.

Elected to Membership

FEBRUARY 13, 1958

SENIOR

William L Acree
John C Anderson
Peter A Arsenault
Frank L Baker Jr
Earl W Boles
Joseph D Brummitt
William B Bushnell
Joseph L Butt
Stanislaw N Chrzanowski
Thomas F Cullen
Edward F Hayes
Jaime H Gallon
Basil S Higham
Marion W Hodges Jr
Stuart I Hunter
Edwin F Landis
William R MacIntyre
Gunther Malue
Lawrence W Mazzeno
Paul K Minta
Fred D Noblett
Edmund H Piltz
Roland E Richards
Edward Robbart
Johnny M Robinson
Charles W Shain
Emory Sherrer
William Sherrill
Robert Snedeker
Romulus H Upton
Arturs Vatvars
Isiah Von
George D Webster
Albert H Wells
Charles E Wells
Howard J White
Edwin H Wolfe
Angelo Zappa

ASSOCIATE

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Rocco R Pangello
William Shields
Peter Smith
Alan Symonds
Richard Turner
Robert Zabrieskie

JUNIOR

Joseph Geraghty
William Healey
Richard Montanaro
John Nettles
Sidney Sands
Howard Sprock Jr
Anthony Wall
William Wall

STUDENT

Gerald Allen
Dwight Carlisle
Marion Hayes
William Lanes
Eugene Robbins
Richmond Terry
Pedro Barcelo
Arthur Canuel
Francis Donahoe
Robert Hart
Raymond McGarty
J Morganstein
J M Pollard Jr
John Simoes
Edward Thomas
Ronald Charves
Robert Robinson
Bahjat Yousif
S Kapashi
K M Mathew
Mark Schiff
Reginald Marchand
Tolen Mitchell
Patricia O'Malley
Margaret Stevens
Toshio Yasuzawa

FEBRUARY 27, 1958

SENIOR

Nelson G Bourret
John W Bowen
Stephen P DeMallie
Ben Goldfield
James R Heard
Guy S Herrick
O Litvay
James D Loper
William M Lybrand
Edward S Mattos
Ira M Schafer
William E Smith
Harold F Williams

ASSOCIATE

William O Crank
Francis Etzel Jr
Stuart Lyman
Cornelius Westerhoff

JUNIOR

Carlos V Uribe
Eugene M Posniak

STUDENT

Preston G Baker
David B Shaughnessy
Richard A J Turner

MARCH 10, 1958

SENIOR

Karapet Avakian
Henry G Black
William Burgess
Jack W Burnette
Ralph E Crean
Martin DeBerardinis
Carlo DeMarco
Raymond Dorchies
Alex Etzel
Frank Flanagan
C M Funderbunk
Richard Harrison
Robert Hodgeson Jr
William Holt
Howard Lathan
Robert Luckadoo
William J McMillan
Clyde Miller
David Moran
Virginia Ruggiero
Manley Sanderson
Robert Savage
M J Shadrick
Patsy Stefanicci
Calvin Steele
Harold Watson
Harold Whittemore
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C H Peterson
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David Tucker

JUNIOR

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L A Edelman
H R Kennedy
Billy Swilley

STUDENT

I D Alewine
R H Barker
R C Bratton
K L Brewton
J M Fox
Leon LaGrand
Jack A Lynch
Henry Perkins Jr
Ervin Poole
John Turner
A W Godfrey Jr
Gordon H Howard
Raymond Rankin
Bobby Tidwell
Tommy Zau

TRANSFER TO SENIOR

J H Martin
Louis R Beck Jr
James C Childress

MARCH 24, 1958

SENIOR

George C Anderson
Gavin T Binner Jr
James A Bowen
Peter Bruinooge
Fritz Buxtorf
Thomas O Caton
Charles C Cohn
Bullock L Cribb
Edward W Curley
Howard F Elsom
Gastao Etzel
Richard Franklin
Charles E Hoey
Oscar W Howard
Robert H Mundy
Richard A Kern
Emily M Owen
Joseph C Reno
John T Parkerson Jr
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Heinz E Schneider
William T Simpson
Stephen E Staudinger
Mario C Tedeschi

ASSOCIATE

Frank Mains
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John F Shelton

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Thomas A Brown
H Owen Duffy
Anthony Ferraz
Norman Gardner
Kenneth Hokanson
Dae Yee Kim
Eugene Kim
Bobby King
Norman Morris
Robert Scroggins
Stephen Swift
Stephen Thompson

TRANSFER TO SENIOR

Thomas L Howle Jr

ACTIVITIES OF THE LOCAL SECTIONS

Delaware Valley

Phillip A Gruber, The Dow Chemical Co, Lee Hall, Va, spoke on the subject "Dyeing of Zefran and Blends Containing Zefran" at the March 7, 1958 meeting of the Delaware Valley Section. The meeting, held at Kugler's Restaurant, Philadelphia, Pa, attracted 105 members and guests.

It was announced that the Section's annual outing would be held May 23 at Torresdale-Frankford Country Club.

South Central

The South Central Section held its Spring Meeting at the Hotel Patten, Chattanooga, Tenn, Saturday, March 29.

Speaker at the technical session was Morton Santymire, Textile Fibers Dept, Du Pont Co, who spoke on "Blends of Polyfibers with Cotton—Dyeing and Finishing Techniques and Advantages".

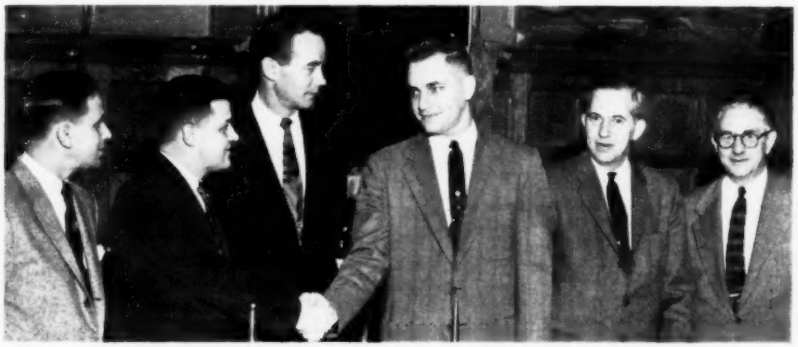
A film, "Land of the Smokies", was shown as an outing preview.

Hudson-Mohawk

The Hudson-Mohawk Section held its spring meeting on March 28, 1958 at Jack's Restaurant, Albany, N Y with Chairman Edward A Chevrette presiding.

Approximately fifty-two members and guests were present to hear K M Leondar, assistant sales manager, Instrument Division of Tracerlab, Inc present a talk on the subject, "Tracers and the Use of Radioisotopes in the Textile Field."

Phillip A Gruber (left), Dow Chemical Co, speaker at the Delaware Valley Section's March 7th meeting, and Edward G Haack, General Dyestuff Co, program chairman.



Those at the head table during March 7th meeting of the Delaware Valley Section (l to r): Charles P Hoffner, Hoffner Rayon Co; William S Sollenberger, American Viscose Corp, chairman; L Kevin McChesney, Leatex Chemical Co, vice chairman; Phillip A Gruber, Dow Chemical Co, guest speaker; Edward G Haack, General Dyestuff Co, program chairman; Albert Geyer.

AATCC Calendar

COUNCIL

May 23 (Philadelphia, Pa); Sept 19 (Charlotte, NC); October 30 (Conrad Hilton Hotel, Chicago, Ill); May 1959 (Montreal, Canada)

NATIONAL CONVENTIONS

Oct 30-Nov 1, 1958 (Hotel Conrad Hilton, Chicago); Oct 8-10, 1959 (Sheraton Park and Shoreham Hotels, Washington, DC); Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa); September 28-30, 1961 (Buffalo, NY)

DELAWARE VALLEY SECTION

May 23 (Outing, Torresdale-Frankford Country Club), Sept 12 (Wilmington Meeting), Oct 17, Dec 5

HUDSON-MOHAWK SECTION

May 16 (Ladies Night, Chelsea House, Tribes Hill, NY); June 20 (Annual Outing, Antler's Country Club, Ft Johnson, NY)

METROPOLITAN SECTION

June 6 (Outing, North Jersey Country Club, Wayne Township, NJ)

MID-WEST SECTION

June 13-14 (Outing—Browns Lake Resort, Burlington, Wis)

NIAGARA FRONTIER SECTION

June 27 (Annual outing); Sept 26 (Niagara Falls, Ont); Oct 24 (joint meeting with CATCC at St Catherines, Ont)

NORTHERN NEW ENGLAND SECTION

May 9 (Lowell Technological Institute, Lowell, Mass); Sept 12 (Outing—Wachusett Country Club, West Boylston, Mass); Oct 17 (QM Research & Development Ctr, Natick, Mass); Dec 5 (Hotel Vendome, Boston, Mass); Jan 16 (Colonial Club, Lynnfield, Mass)

PIEDMONT SECTION

Apr 25-26 (Washington Duke Hotel, Durham, NC); June 6-8 (Outing—Grove Park Inn, Asheville, NC); Sept 19-20 (Hotel Charlotte, Charlotte, NC)

RHODE ISLAND SECTION

Apr 25 (Students Night—Bradford Durfee College of Technology, Fall River, Mass); June 13 (25th Annual Outing—Wannamoisett Country Club); Sept 26 (Management Night—Warwick Country Club); Oct 23 (Providence Engineering Society); Dec 4 (Annual Meeting—Johnson's Hummocks Grille, Providence)

SOUTH CENTRAL SECTION

Mar 29 (Hotel Patten, Chattanooga, Tenn); May 30-31 (Summer outing—Hotel Greystone, Gatlinburg, Tenn); Sept 13 (Hotel Patten, Chattanooga, Tenn)

SOUTHEASTERN SECTION

June 6-7 (Summer outing—Radium Springs Lodge, Radium Springs, Ga); Sept 13 (Ida Cason Callaway Gardens, Chipley, Ga); Dec 6 (Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

May 16 (Ladies Night—Rapp's Paradise Inn, Ansonia, Conn); June 13 (Outing—Wallingford Country Club, Wallingford, Conn); Sept 26 (Hartford, Conn); Oct 24 (Annual Meeting—Rapp's Restaurant, Shelton, Conn); Dec 5 (Rapp's Restaurant, Shelton, Conn)

THE SECOND EDITION
of
THE COLOUR INDEX
IN FOUR VOLUMES
IS NEARING COMPLETION

Volumes 1, 2 and 3 are being distributed to prepaid subscribers.

Your prepaid order will bring these three main volumes to you immediately.

Volume 4, completing the set, will be ready in the Fall.

The First Edition of the COLOUR INDEX was published in 1924 and now, thirty-four years later, the Second Edition is nearing completion. You cannot afford to wait for some future edition and there is available no other current index of world coloring matters.

A LIMITED EDITION
SETS STILL AVAILABLE
at
$112.00 the Set Delivered

Your prepaid subscription received promptly will insure complete delivery this year of this tremendously valuable work on the free world's dyestuffs and pigments in commercial use. Published by the Society of Dyers and Colourists (British) and the American Association of Textile Chemists and Colorists, these four volumes represent ten years of intensive work in assembling and editing the data. They include approximately 3000 pages of application and fastness properties of coloring matters as furnished by world manufacturers, chemical and structural information, characteristic reactions, index of products and trade names, fastness tests and rating methods, new and old COLOUR INDEX NUMBERS, Schultz and AATCC prototype numbers and a Hue Indication Chart.

Further Particulars from

American Association of Textile Chemists and Colorists

PO Box 28, Lowell, Massachusetts

Inter Alia—Inter Nos

P J WOOD

DIMENSIONAL STABILITY

Gone are the days when a new undershirt, or any other kind of shirt, for the matter of that, returned from its first visit to the laundry a mere shadow of its former self. Some of them might have been reasonably expected to take on a new vocation as a fairly serviceable "bra".

This is not to say that we consider the ultimate in stability has been reached, but to record the fact that progress has been made.

Occasionally, we have to admit that we have come into possession of a shirt which, after a laundering or two, shows some signs of being guilty of attempted strangulation; but this is sometimes not the total fault of the finisher, but may lie at the door of the maker of the garment, due to a wrong choice of a cloth, as far as construction is concerned. We wouldn't put it beyond the laundryman to make a faux pas once in a while either.

In the old, old days, many finishers made it a point of competition to deliver more finished yardage than other finishers. We seem to remember one Smart-alec who even bought a few bales of the same type of goods, so it is said, in order to deliver a fantastic "stretch", which no competitor could beat.

While we were writing this article, Dick Jones dropped into our office and showed us a beautiful Oxford shirt, which he took with him on a recent Southern trip. He washed it twice and we would swear that it came fresh out of the box in which he received it at Christmas. The white was like unto driven snow, the finish was soft and supple and there wasn't a crease in it, in spite of the "drip-dry" method employed by Dick himself to wash it, without any ironing (maximum, median or minimum) whatsoever.

The only thing we didn't like about it was that it was WHITE. You know as well as we know that most of us make our living by selling the fast colors required to dye shirt materials, or, like Dick and this scribe, the reducing agents and other auxiliaries that go with those fast dyestuffs. Dick said he hadn't been able to get any other color.

For this reason, it seems logical that all of us should make it a rule to wear colored shirts, the "badge of our profession", as the immortal William put it. A good slogan for the dyestuff and chemical salesman, the weaver and the dyer and printer would be:

"A vat-colored shirt a day keeps the sheriff away".

CONTRASTS

Although there is weeping and wailing and gnashing of teeth in the textile industry, as a whole, and particularly in the textile coloring sections of that distressful industry (bleaching, dyeing and printing), there is joy in many sections of the fiber manufacturing ilk.

The latest report from Chemstrand paints a glowing picture of profit and progress with projected expansion of activity in several parts of the world.

Only the year before last, we heard of the breaking of ground for that wholly owned subsidiary, Chemstrand Limited, the British scion of the family, which will have its being in Northern Ireland. Now, we are told, first production is confidently expected late this year.

Licenses to manufacture the company's acrylic fiber or fibers have been granted to Societa Industrie Chimiche Edison of Milan, Italy, and to the Mitsubishi Rayon Company, Limited, of Toyko, Japan.

No wonder the new color film, "Fibers and Civilization" now being produced by Chemstrand, has been selected by the US State Department for showing in the American Pavilion at the forthcoming World's Fair, which opens in Brussels about the middle of next month.

MOTIVATION RESEARCH

At the recent convention of the Soap Association, which, by the way, used as its theme this year "The Acceleration of the Pace of Change", a theme which would be an appropriate postulate for almost any trade association that one could mention, there were presented a number of provocative papers which should make good reading, when published.

One of these had the title of this paragraph-or-two, with the appendix, "Beginning or the End", read by Harry Deane Wolfe, who is the managing director of Behavioral Science Research, Inc.

Among other things Dr Wolfe said, "Motivation research is here to stay because it is needed to do the job of finding out why people do what they do . . . in the next five years, fully 50% of the analytical personnel in marketing research will be recruited from the behavioral sciences (psychology, sociology, anthropology, etc), while the remainder will come from the present sources, such as mathematics, statistics, and marketing".

The speaker outlined various ways in which soap and detergent manufacturers could make use of motivation research to good advantage, and we feel we could think of several ways in which it could be employed to keep other types of industrialists from persistently following that broad path which leads to destruction.

FAST COLORS

Every month Anne Fallon, the talented editor (or should we say editress?) of "Digest", the monthly review of technical literature of the Association of American Soap and Glycerine Producers, Inc, sends us a copy of this interesting compilation.

Dyers and finishers would find something of interest in nearly every issue. For instance, in the February number are such items as "What's What in 'Wash & Wear' "; "Homemakers Seek Washability in Household Furnishings"; "Institutions Test Colored Linens for Launderability"; "Surfactants Found to Protect Wool Against Acid Damage in Garbonizing Mills";"Sewage and Water Treatment". Each of these being an able condensation of an article appearing in worthwhile journals all over the world.

But,to get to our subject, two of the items above mentioned hinge on the matter of fast colors and the consumers' preference for same. The US Department of Commerce has released a report of an investigation carried out by its Agricultural Marketing Service Division, based on 2,709 (good measure for 2700 or shortchange for 2710) interviews with homemakers regarding their likes and dislikes for draperies, rugs and carpets, blankets and bedspreads and tablecloths. As with one voice, the girls, young, old and middleaged, affirmed that, next to durability (good wearing qualities) they liked their colors FAST.

This puts the responsibility squarely up to the dyer.

The other article, "Institutions Test, etc", was published in the February number of Institutions Magazine. You'll find it on page 63, the title thereof being "Are Colored Linens Practical?".

It seems that the American Hospital Association, members of the Executive Housekeepers Association and the dyestuffs division of E I duPont de Nemours & Co, Inc set out to find the answer to the above question.

They supplied the housekeepers of twelve top-flight hotels with enough colored linens, towels, bath mats, etc, etc, to keep four rooms continually supplied with these necessaries for a year. These were washed together with the hotel's own linens and by the same laundering methods, probably varying somewhat from inn to inn.

The specialists who examined the test articles after this year of service concluded that there was no change of color after the first six months. They found that there was no discernible difference between linens that had been used for six months and those that had a year's use.

If the matter had been gone into in even finer detail, we venture to say that it would be found, in the case of most colors, that any change took place in the first few trips to the laundry. FAST colors again!——Q.E.F.

News of the Trade

Allied Chemical Name Change

One of America's large diversified chemical companies doing business since 1920 as Allied Chemical & Dye Corporation is about to become simply Allied Chemical Corporation.

In connection with the proxy statement sent to stockholders last month, Glen B Miller, president, said:

"The Board of Directors believe that the proposed new name will more clearly reflect the broad nature of the Company's position in the chemical industry and will not single out a particular Division or field of activity.

"It is also believed that the shorter name will be better adapted to identify the Company in its public and trade relations and in advertising its products."

The recommendation will require the affirmative vote of the holders of the majority of the outstanding common stock of the company and if approved will become effective by May 1.

According to Mr Miller, the proposal "in no way implies lack of interest in our dye business." Referring to the history of Allied he said:

"When the Company was formed in 1920, memories of the World War I dye famine—which had been relieved by National Aniline's all-out efforts—were fresh in people's minds and it was desirable at that time to give the new corporation the benefit of close association with National Aniline's achievement.

"Today there is no longer any reason for stressing any one line of products in the Company's name, although synthetic organic chemicals—which includes dyes — constitute roughly one-fifth of our production total."

Allied's six operating Divisions have about 30,000 employees who produce some 3,000 products at more than 120 plants, laboratories, mines and quarries. Products are marketed through the Company's International Division in foreign countries.

On the research side, Allied operates 12 laboratories which employ more than 1600 chemists and technicians. At present, an estimated two-thirds of the Company's research budget goes into the development of new products and processes. The remaining one-third is used for improving properties of existing products and for fundamental and application research.

An over-all view of American Cyanamid Company's new aniline manufacturing facilities at Willow Island, W Va

Production of Aniline Oil Begun at Cyanamid's Willow Island Plant

American Cyanamid Company has begun production of aniline oil at its new multimillion-dollar catalytic aniline plant at Willow Island, W Va, making use of an entirely new manufacturing process.

The newly constructed facility reportedly uses a fluid-bed reactor and new catalyst for the first time in manufacturing aniline from nitrobenzene by this reduction process. Cyanamid officials are confident that it will permit the Company to manufacture an improved product at a lower cost.

A fluid-bed reactor (contrasted with a fixed-bed reactor) is one in which the catalyst is so finely powdered that it flows like a liquid. Use of this type reactor is said to allow a more accurate control of manufacturing processes.

An outdoor type installation, the new aniline plant covers more than five acres of land located on the northeastern section of the company's plant site. Cyanamid located the plant at Willow Island in order to provide better service to its customers in the midwest.

When in full operation, the unit will provide jobs for approximately 75 additional people. It has a rated annual capacity of 24,000,000 pounds.

Special units built include those for the manufacture of nitric acid, nitric acid concentration, sulfuric acid concentration, acid mixing, hydrogen, nitrobenzene and aniline.

Cyanamid's Willow Island plant, built in 1946, is located on the Ohio River midway between Parkersburg and St Marys, W Va. It normally employs about 625 people. The new aniline manufacturing facility was constructed by Chemical Construction Corporation of New York. Cyanamid's Engineering and Construction Division supervised all building activity.

Amalgamated Names Virkler Southern Representative

Amalgamated Chemical Corp, with offices and plant in Philadelphia, Pa, has announced the appointment of Virkler Chemical Company as southern representative. Virkler Chemical Company maintains offices and warehouse in Greensboro, NC.

Amalgamated Chemical manufactures a complete line of chemicals for the textile wet processing industry. Through the appointment of Virkler Chemical, Amalgamated feels that more complete coverage and better service will be offered to the industry.

Chas S Tanner Co to Build in Greenville

Chas S Tanner Co, with main office and plant at 250 South Water St, Providence 3, R I, has purchased approximately two acres of land in Greenville, S C, and contracted with Triangle Construction Co for the erection of a suitable building for warehousing and plant production.

The building, due to be completed in 3 to 4 months, will be of stacked brick construction and equipped with a railroad siding and all modern facilities. The interior will house suitable offices, laboratory and plant facilities which will put the Company in a position to manufacture in the South many of the products which have been manufactured in New England.

Geigy Issuing Guaranty to Mills Using Mitin

Geigy Dyestuffs, Division of Geigy Chemical Corporation, is issuing a guaranty to mills applying its Mitin durable mothproofer to all-wool or wool-blended fabrics, that the fabrics, if properly treated in accordance with Geigy's directions, will not be damaged by moth and beetle grubs or other keratin-eating species of insects. The guaranty applies as well to mills which use commission dyers for their Mitin application.

According to the guaranty, Geigy will pay the mill the actual cost of repairing or replacing the article at net price, whichever is less, if such insect damage occurs within the period of 5 years from the date of proper treatment.

In addition to 1958 being the 200th anniversary of the founding of the international chemical firm of Geigy, this year also marks the tenth successful year that its Mitin durable mothproofer has been used on ready-to-wear and home furnishings items manufactured in the United States and Canada, and the twentieth year that Mitin has been in use around the world.

It is claimed that, since Mitin was first introduced to U S and Canadian mills in 1948 for test purposes, more than 200 million children's, men's and ladies' garments made of all wool or wool-blends have been protected against possible damage from wool-eating moth and beetle larvae. Millions of square yards of carpeting, drapery and upholstery fabrics, and knitting yarns have been similarly treated with this chemical. Worldwide figures run much higher than the U S figures.

Geigy has maintained two methods of control in the use of Mitin by textile mill operators and dyehouses, to protect the mill against possible insect damage claims. Mill operators, who sign agreements to use Mitin, submit samples to Geigy periodically of runs of yarn or fabric which has been treated with Mitin. A chemical analysis test is made for each sample to determine that the prescribed minimum amount of Mitin is on the goods. Meanwhile, an entomological test is made of the same run to determine that the material is impervious to damage by moth or beetle larvae. In ten years of conducting such tests on thousands of samples of material submitted by its customers, Geigy reportedly has found no case of provable damage to woolens by moth or beetle larvae where Mitin was applied according to directions.

Mitin, applied like a dyestuff, becomes chemically bonded to the woolen fibers, reportedly protecting the fabric for its usable life against possible damage from moth and beetle larvae. It is said to be colorless, odorless, fast to light, wet or drycleaning and abrasion, and less toxic than ordinary table salt.

Seminar on Utilization of Radioisotopes

A two-day seminar on "Utilization of Radioisotopes" will be held Thursday and Friday of this week at The Clemson House, Clemson, SC.

The two-day seminar, first in a proposed series in the United States, is designed jointly for management and technical personnel, in research and production. Sponsoring is the Clemson School of Textiles in cooperation with the Regional Advisory Council on Nuclear Energy, Southern Governors' Conference; South Carolina Textile Manufacturers' Institute and the United States Atomic Energy Commission.

The seminar will study the application of isotopes to production and research in textiles. Proposed uses involve starches, resins and other finishing materials. Isotopes are currently being used successfully in control and production of plastic coverings and films.

The opening-day program will be devoted primarily to management, with technical papers and discussions on Friday.

Presiding over the seminar will be Alan B. Sibling, president, South Carolina Textile Manufacturers Association; Alfred T Clifford, chairman, Committee on Nuclear Radiation, AATCC; Gaston Gage, acting dean, Clemson School of Textiles; Russell B Newton, vice-chairman, research and technical service committee of the American Cotton Manufacturers' Institute; and W T Rainey, head of the Clemson College research department.

14 Countries to Participate in Textile Machinery Exhibition

The 1958 International Textile Machinery & Accessories Exhibition, to be staged at Belle Vue, Manchester, England, from the 15th to the 25th of October, will house the displays of some 325 firms from 14 countries in over 150,000 sq ft of exhibit space.

The Exhibition, fifth in the post-war series of *Textile Recorder* international exhibitions, will include among the numerous displays, machinery, equipment and accessories for bleaching, dyeing and finishing processes for natural and man-made fibers. Among the machines on view will be a fluid-bed drying machine, a polymerizing chamber of new design, a single-strand, molten-metal dyeing machine, and an automatic screen printing machine. In addition, there will be several examples of carpet tufting machinery, and the latest type of latex spreading and drying machinery.

Avisco "Aid-to-Education" Program

Seventy-eight colleges and universities will benefit next year from the aid-to-education program of American Viscose Corporation. In announcing the plans for the 1958-59 academic year, Henry H Bitler, vice president, declared "We take pride in our continued association with the many American business organizations that are aware of the increasing importance of industry participation in the future of education. As in previous years," he stated, "the program includes scholarships, fellowships, grants-in-aid, and assistance through educational foundations.

American Viscose Corporation's program is designed to aid these educational institutions in their overall programs and encourage the study of science and engineering. The recipients of the scholarships and fellowships are selected by the schools on the basis of scholastic merit and need. American Viscose takes no part in this selection, nor are the students under any obligation to the Corporation.

Scholarships valued at $500 each have been awarded for undergraduates who are majoring in textiles, chemistry, physics, engineering, and business administration. Fellowships fo graduate work, ranging from $1,700 to $2,800, have been established in the fields of chemistry, chemical engineering and cellulose chemistry. Grants-in-aid have been awarded for research in fields of packaging films and textile fibers in addition to the general fields covered in scholarships and fellowships.

• NEW PRODUCTS AND DEVELOPMENTS •

Cibacron Black BG; Cibalan Black 2GL; Benzyl Green F3G

Cibacron Black BG, the first black dye of the fiber-reactive type, is now being introduced by Ciba Co, Inc. An original product of Ciba research, this newest member of its Cibacron group reportedly combines for the first time a good neutral black shade with the many advantages of fiber-reactive dyes. It supplements the bright color range of the Cibacron dyes with a clean black shade having the same general dyeing and fastness properties, extending the designing possibilities offered by this group of dyes.

Cibacron Black BG offers the simple application and superior fastness properties that are associated with the Cibacron name for printing and dyeing cotton and rayon, it is claimed. It is anticipated that the dye will prove of considerable interest in printing on cotton, especially on mercerized cotton goods, where, it is stated, a jet black is obtained with outstanding light- and washfastness. Its use in printing patterns with other Cibacron dyes reportedly eliminates the problem of adding a different type of dye to obtain a good black. In addition to printing, it is stated that the new Cibacron Black BG may be applied in piece dyeing, being especially useful for dyeing by pad-steam, pad-Thermofix and exhaust methods. Its application in exhaust dyeing is said to increase the range of fabrics on which it can be used.

Ciba suggests that designers and dyers will find Cibacron Black BG a welcome dye for cellulosic fibers. The Company states that the novel properties which reactive dyes have brought to textile dyeing are given full range with addition of a straight black of this class.

* * *

In introducing a new "matching black" to its Cibalan range, Ciba states that travelwear, wool suitings, men's hosiery and other wool, nylon and silk applications will be enhanced by the new Cibalan Black 2GL, a straight black with a greenish cast. Excellent lightfastness and simple application methods are claimed to make Cibalan Black 2GL an ideal companion to the neutral shade Cibalan Black BGL.

Cibalan Black 2GL is said to bring added versatility to the dyer confronted with matching blacks from neutral to jet shades.

Full black shades of better than 200 hours lightfastness and good washfastness reportedly are obtained on wool and nylon in 7% dyeings of Cibalan Black 2GL. The dye is said to yield level results in union dyeing, especially on wool/spun nylon unions; and it provides added range to the Cibalan series for easier shade matching.

* * *

Reportedly providing clean attractive yellow-green shades with good fastness on wool, nylon and silk, Benzyl Green F3G is said to exhibit excellent build-up into heavy shades, especially on spun nylon. Similar in dyeing and fastness properties to the Cibalan dyes, but not quite equal to the Cibalan standard in lightfastness, Benzyl Green F3G reportedly levels well and shows very good fastness to wet treatments including washing and milling. Applicable in neutral or acid baths, Benzyl Green F3G is said to withstand topchroming and to be highly suitable for use with Cibalan and chrome dyes.

Curites

Proctor Chemical Co, Salisbury, NC, has announced the release of a series of four catalysts specifically designed to promote the cure acceleration of thermosetting resins. These catalysts, known as the Curites, are based on metal salts and organic compounds. They are described by the manufacturer as being water-white liquids that do not discolor during high-temperature curing.

SD 200

Laurel Soap Mfg Co, Inc, is recommending its SD 200 as a superior agent for raw wool scouring, fulling and scouring of woolen and worsted piece goods, and scouring of cottons, rayons, and acetates. An amine-fatty acid condensation product of essentially 100% concentration, it is also said to be highly useful in the dyeing of yarns and fabrics, and for soaping off prints.

SD 200 reportedly is stable to hard water and, used with soap, is said to prevent the formation of hard soap curds. Application of Laurel SD 200 is claimed to be simple as well as effective.

Free sample and further instructions may be obtained from Laurel Soap Mfg Co, Inc, Tioga, Thompson & Almond Streets, Philadelphia 34, Pa.

Dyes for Heat-textured Filament Nylon Leave Dacron White

Supplementing its line of dyes for coloring heat-textured filament nylon without barré effects, Sandoz, Inc, has announced the development of a specialized group of dyes, barré-free, fast to light, washing and perspiration, and with the added characteristic of reserving a pure white on Dacron polyester fiber.

Current market interest in knitgoods made from Bancroft's Ban-Lon, and competing yarns, trimmed with white Dacron, reportedly spurred this new development. With this line, it is said to be possible to dye the nylon and leave the Dacron unstained.

Sandoz is informing customers that dyes in this special Dacron-reserved group should be applied with the same leveling agent required for dyeing barré-free filament nylon by the accepted Sandonyl/Lyogen P method.

Forever White

Forever White, a nonyellowing white flock adhesive, has been developed by Lucerne Industries Corp, 61 Van Dam Street, Brooklyn 22, NY.

It reportedly can be used with all synthetic fibers, plastic and metal flitters, ground cork, mica, etc, for use on cotton, rayon, acetate, nylon, Dacron, Orlon and many other surfaces. It is said to offer much better adhesion while wet during washing than ordinary flock adhesives and reportedly will not yellow on storage or after laundering. It is said to be very flexible and to cure at low heat in 15 mins to 1 hour and at high heat in minutes.

Willow Green C-69; Copper Leaf C-70

Two new colors have been added to the Celaperm solution-dyed acetate color line of Celanese Corporation of America.

The new colors are designated as Willow Green C-69, a soft green, and Copper Leaf C-70, a light copper. They are being made available in regular Celaperm deniers and are suitable for both warp and filling.

End uses for the new Celaperm colors are reported to include home furnishings, women's apparel and men's shirtings.

Procion Brilliant Blue H7G

Procion Brilliant Blue H7G, available from Arnold, Hoffman & Company, Inc, Providence, RI, is one of eighteen presently available dyes in the Procion group, which reportedly achieve high wet fastness when applied to cellulosic fibers by formation of an actual chemical linkage between dye and fiber.

Arnold, Hoffman describes Procion Brilliant Blue H7G as a homogeneous product which on cellulosic fibers gives brilliant turquoise blue shades of very good fastness to light and washing.

For the printer, Arnold. Hoffman states that Procion Brilliant Blue H7G represents an important addition to the Procion range, enabling him to produce brilliant turquoise shades on cotton and viscose rayon by steaming and nonsteaming processes. Admixtures of this dye with Procion Brilliant Yellow 6G are said to produce outstandingly attractive green shades. which also show high lightfastness and good washfastness. These shades have the advantage of fading on tone when fading eventually does occur, and such greens can be confidently recommended for upholstery fabrics, it is stated.

Procion Brilliant Blue H7G may be applied to cellulosic fabrics, according to Arnold, Hoffman, either by pad-dry-steam or by hot batchwise procedures in conventional equipment at temperatures in the 185°—212° F range. It is said to be suitable for the dyeing of silk by the processes recommended for the earlier Procions, except that in the alkaline dyeing a temperature of 120° F is used.

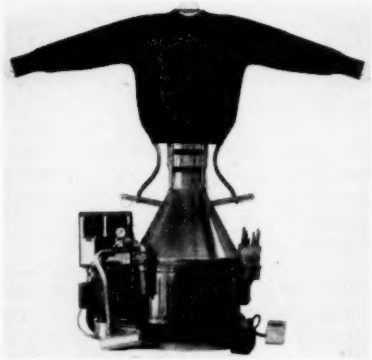
A bulletin giving further information on the application and attributes of Procion Brilliant Blue H7G is available from Arnold, Hoffman & Company, Inc.

Hartoresin NV

Hart Products Corp has announced the development of Hartoresin NV, a polyvinyl acetate emulsion developed specifically for textile finishing. Hartoresin NV reportedly exhibits high storage stability and gives maximum body and stiffness on cellulosic and synthetic fabrics.

Hartoresin NV is recommended by Hart Products for snag-resistant finishes on hosiery, stiffening lace nets, anticurl treatment for tricot knits, bodying agent for resin-treated cottons and for numerous other applications in the textile and allied fields.

Samples and technical service sheets may be obtained by writing Hart Products Corp, 1440 Broadway, New York, NY.



Paris Sweater Finisher

Additional Models of Paris Sweater Finisher Introduced

Introduced last Mav at the 1957 Knitting Arts Exhibition, early production models of the Paris Sweater Finisher were announced as "the world's first machines for automatically pressing sweaters." The Paris demonstration at Atlantic City was limited to machines for pressing ladies' sweaters. During recent months, additional models have been perfected for pressing men's sweaters in all sizes including "Jumbo," and a special model to handle children's sizes from infants' through one and two and upward to size twenty.

This range is achieved with no sacrifice of precision in turning out each of the specified measurements and the distinctive contours of all sizes, it is claimed.

In announcing the introduction of the new Paris Press and its four-unit installation in the Philadelphia plant of Huntingdon Mills, where development and testing work was done by Morris Soowal and his associates, Felix Renick, president of Paris Manufacturing Co, attributed the rapid acceptance of the principle of steam-air finishing of sweaters by the industry (reportedly indicated by Paris installations in sixty-eight sweater mills in nine months) to "the machines' two-fold ability to produce better-looking sweaters faster than can be done with conventional steam tables or flat-bed presses, and to do so without skilled help."

"Paris' precision pressing," he added, "would be impossible were not the machines custom made. since few if any firms make sweaters having exactly the same shape."

The Paris' design and method of construction reportedly permits all of the machine's components to be made to correspond exactly with each manfacturer's patterns and measurements. It is claimed that, with these specifications built into the machine, it automatically presses the sweaters uniformly. All will be the same.

Resin O-4

Resin O-4. a new, water-soluble, cellulose-reactant resin, has been developed by Onyx Oil and Chemical Co, Jersey City 2, NJ.

The new resin, especially developed for cellulosic fabrics, is said to impart the qualities of crease resistance and shrinkage control. One of its outstanding properties is said to be its exceptional resistance to chlorine degradation even after launderings at the boil.

It is stated that, because Resin 0-4 reacts with cellulose, it creates stabizing and crease-resistant effects on rayon and cotton with resulting additional qualities of a soft hand and excellent durability.

It is reported that other advantages of the resin are its flexibility in obtaining desired hand, minimum effect on physical properties, ease of solubility, durability to alkaline washes, and absence of resin buildup on texturizing equipment.

Basically Resin 0-4 is a cyclic aliphatic resin in a clear, semiviscous syrup state. It has a solids content of approximately 50 and a pH of 7.8 to 8.0. Data sheet available.

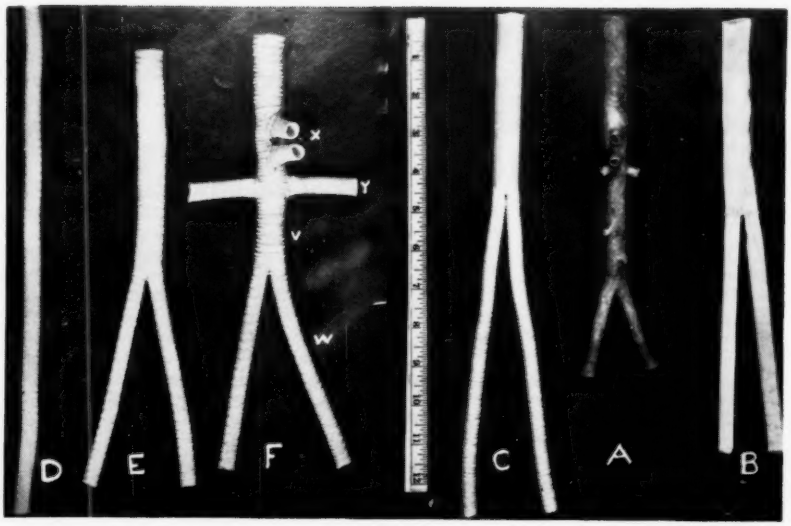
Duron DF

The Duron Corp, Bedford, O, has announced the completion of laboratory and mill tests on its new Duron DF, and that its Duronizing process, a method for a simple, chemical treatment of wool fibers "to imbue them with permanent resistance to moths and carpet beetles" is now being applied at the mill level.

The Company states that the major advantage of Duron over other products is its price; it is claimed that approximately ¾¢ of Duron DF will treat a pound of wool where costs of other permanent mothproofing treatments range somewhere between 5-7¢ a pound.

It is further claimed that Duronized permanent mothproofing will last the life of the article, and that Duronized woolens withstand drycleaning, wetcleaning, and all wear or handling.

Duronizing is said to be an adaptation of discoveries made by Australian scientists. Duron Corp states that Australian companies which have been using a similar process for the past four years feel that the claims for it have now been proven. It is claimed that Duronized blankets have been churned in boiling washes for more than 2½ hours and have still come out mothproof; others have been subjected to atmospheric exposure in open sunshine and rain for six months without loss of mothproof properties.



Pictured here are natural and artificial replacements for defective arteries in the human body. D—single artificial tubing; E—artificial bifurcation shaped seamless arteries; F—artificial multibranched tube; Rule; C—one of the early braided bifurcation tubes abandoned because of raveling; A—homograft taken from the body of a deceased person; B—early artificial bifurcation tube requiring hand stitching

Dacron Knitted Artery Developed at PTI

The Research and the Knitting Departments of the Philadelphia Textile Institute, Philadelphia, Pa, have developed a Dacron knitted artery which is said to have been successfully used as a replacement for defective arteries of the human body.

Approached by Michael DeBakey, head of research, Baylor University, in 1956, Percival Theel, head, Research Department, PTI, and Thomas Edman, Head, Knitting Department, PTI, spent two years in developing a near-perfect arterial replacement with the following characteristics: a straight and multibranched tube that can be used in different sizes for the human body, one that is chemically and physically inert, tightly knitted, and coated to prevent leakage of blood prior to the forming of natural tissue on the inside of the new tube, easy to cut and sew without drop stitches and fraying, and able to withstand the sterilization in an autoclave.

Dr DeBakey and his assistants perform as many as eight arterial operations daily using this new tube.

Pontamine Fast Orange DL; Capracyl Green 2Y

A new "lightfast direct dye that produces yellowish-orange shades highly resistant to the effects of resin treatments on cotton and rayon" has been introduced by the Du Pont Company.

Designated Pontamine Fast Orange DL, the new dye is said to be of particular interest as a self-shade or as a shading component in compound shades for use on spun rayon in conjunction with resin aftertreatments. It is recommended by Du Pont for use on dress goods, sportswear, suitings, upholstery and drapery materials, and other fabrics, for end uses requiring good fastness to light, washing, perspiration, and other color-destroying influences.

Pontamine Fast Orange DL reportedly has good solubility, dyes levelly, penetrates well, and can be applied by padding.

When used to dye cotton or rayon fabrics containing other fibers, it reportedly imparts no stain to acetate, Dacron polyester fiber, or Orlon acrylic fiber. It is said to stain nylon only slightly, show noticeable staining of wool and considerable staining of silk.

* * *

Latest addition to Du Pont's line of Capracyl dyes for use on nylon and wool is a bright green, designated Capracyl Green 2Y, which is particularly recommended by Du Pont for materials to be used as suitings, carpeting, or upholstery fabrics.

Reportedly possessing good lightfastness and wet-processing properties, it is claimed that the new product dyes nylon or wool levelly, builds up on tone from pastel to full green shades, and can be applied in all types of conventional equipment to raw-stock, yarn or fabric of filament nylon, spun nylon, or wool. It becomes yellower in shade under incandescent light.

Irgalan Bordeaux GRL; Tinon Yellow LGR Paste

Irgalan Bordeaux GRL has been added to Geigy Dyestuffs' series of neutral-drawing, premetallized dyestuffs for coloring wool, nylon or silk alone or in blends with cellulosic fibers. The new color produces brighter shades of red than were available previously from colors in the Irgalan line, and it rounds out the red portion of the spectrum, according to a company spokesman.

Irgalan Bordeaux GRL reportedly possesses the very desirable lightfastness rating of 7 for wool and attains the same numerical rating on nylon. It also is said to show excellent fastness ratings in such other categories as domestic washing at 100°F (5); acid and alkaline perspiration (5); dry- and wetcleaning (5); hot dry pressing (4-5); sea water shade change or bleeding-wool (5); carbonizing (4); crocking, dry (5); wet (4); and chlorination (4).

* * *

Geigy has also introduced a new, bright, clean anthraquinone vat yellow, which is said to produce pleasing golden yellow self shades on cotton and rayon. Called Tinon Yellow LGR Paste, the new vat dyestuff brings to six the number of yellow shades in the Geigy vat series. It is greener than Yellow PGA and slightly redder than Yellow P2GA.

According to the manufacturer, Tinon Yellow LGR Paste is characterized by excellent lightfastness as compared with other vat yellows, with ratings of 5-6 for light shades, and 7-8 for heavy shades in sunlight, with relatively parallel fastness in the Fade-Ometer. It is said to be especially desirable for the dyeing of fast-to-light shades, either as self shades or in combination with other fast-to-light vat colors.

Additional interesting properties of Tinon Yellow LGR Paste claimed by Geigy are: excellent dispersion, very little shade change on soaping, stability at high temperatures, excellent over-all fastness properties and level dyeing.

Information bulletins 78-G on Irgalan Bordeaux GRL and V-36 on Tinon Yellow LGR Paste are available from Geigy branch offices or the home office at Ardsley, NY.

VOLUME 3
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TECHNICAL LITERATURE

(Literature is available from sources shown in italics)

ADDUCTS OF NONYLPHENOL OR TRIDECYL ALCOHOL WITH ETHYLENE OXIDE—*Jefferson Chemical Co, Inc, 1121 Walker Ave, Houston 2, Texas* ———These surface-active agents are marketed under the registered trademark, Surfonic.

The 40-page manual provides available information on analytical procedures, physical and surface-active properties and typical industrial uses of these nonionic surfactants. Also included is information on toxicity and sales specifications of the commercial grades available from Jefferson Chemical. A typical sulfation procedure is a feature of the book.

ALUMINUM PRODUCTS LIST AND APPLICATION SHEET—*Hummel Chemical Co, 90 West St, New York 6, NY* ———Hummel Chemical Company has issued an aluminum products sheet describing 17 standard grades of aluminum powder it currently offers. Atomized, granular, leafing and nonleafing flaked powders are included among the products listed. The powders are used for many applications such as textile coatings, chemical processing, printing inks, etc.

Also available is an aluminum application sheet which is designed for customer use in submitting preliminary information on new applications. It can also be used for technical problems related to established usages of aluminum powders.

BECCO CONTINUOUS BLEACHING WITH HYDROGEN PEROXIDE—*Becco Chemical Div, Food Machinery and Chemical Corp, Station B, Buffalo 7, NY* ———A comprehensive presentation of the advantages of continuous bleaching of cotton goods with hydrogen peroxide, plus a detailed description of the procedures and equipment that represent the best current practice, is contained in this attractive new 24-page brochure.

Among the advantages cited for continuous peroxide bleaching over kier bleaching or other batch bleaching systems are these:

1) Continuous peroxide bleaching treats yard after yard identically, in terms of time, temperature, and chemicals, resulting in the production of goods with uniform color and uniform absorbency, week after week.

2) It uses only half or less of the water required in kier bleaching for a given quantity of fabric.

3) Only a fraction of a pound of steam is required per yard of goods bleached, compared with two or three pounds in kiers. Chemicals used average as much as one-third less.

4) It requires only 1 to 3 hours of processing time from grey goods to white goods, as compared with 16 to 24 hours in kier bleaching.

5) Continuous bleaching needs only half the floor space of kier equipment for the same quantity of goods.

6) Man-power required is only half, or less.

BIBLIOGRAPHICAL ABSTRACTS OF METHODS FOR ANALYSIS OF SYNTHETIC DETERGENTS STP 150-B—*American Society for Testing Materials, 1916 Race St, Philadelphia 3, Pa; 24 Pages, Paper Cover, 6" x 9", $1.50*——— The continued effort to standardize methods for surface active-agent analysis has necessitated continuous scrutiny of the literature. Ordinarily a compilation of this kind might be issued at less frequent intervals, but to be of greatest assistance to those working in this field, the abstracts should follow the original literature as closely as possible. Hence, though the number of references may be fewer, their availability should outweigh the inconvenience of more frequent preparation.

This book supplements the previous volumes of this title designated STP 150 and STP 150-A. It includes information through 1957 and refers back to 1933, not previously listed.

CHLORINATED P-XYLENE COMPOUNDS—*Diamond Alkali Co, Product Development Dept, Research Ctr, Box 348, Painesville, O*———A series of informative data sheets of six chlorinated p-xylene derivatives recently developed by the Product Development Department of Diamond Alkali Company.

The data sheets, furnished with a file folder for convenient handling and quick reference, present information covering physical properties and chemical reactions of a-chloro-p-xylene; a,a'-dichloro-p-xylene; a,a'-hexachloro-p-xylene; 2-chloro-p-xylene; 2,5-dichloro-p-xylene and 2,3,5,6-tetrachloro-p-xylene.

COMMERCIAL FINANCING — *The Foundation for Management Research, 121 West Adams St, Chicago 3, Ill*— Within the next decade, many more cotton cloth mills will be using commercial financing to expand their production and sales, according to Theodore H Silbert, in a study for The Foundation For Management Research. The study indicates that while many of the older and larger manufacturers have used commercial financing in their more youthful, growing years, the difficulty today is that the younger companies do not know how commercial financing operates.

Silbert, the author of the study, is board chairman of the Association of Commercial Finance Companies of New York, and president of Standard Financial Corporation. Free copies of the study are available from the Foundation.

The study is aimed at describing accounts receivable financing, factoring, financing of instalment sales of finished goods by manufacturers, and costs and mechanics of different types of financing.

Commercial financing, Silbert's study indicates, advanced a total of about $11 billion to industry in 1957. Of that vast sum, open accounts receivable financing accounted for $6.5 billion and factoring for $4.5 billion.

The sole object of commercial financing, Silbert pointed out, is to augment a company's working capital so that it might expand sales and production. How such financing differs from bank borrowing, is indicated in the study:

"In normal borrowing, banks will usually look at a manufacturer's or distributor's net worth, and scale credits to conform with the borrower's net worth. A company having (say) $1,000 in net worth, but $1,000,000 in sales, would have a most difficult time borrowing more than a percentage of the net worth. But since in commercial finance, it is the receivables which are important, a manufacturer in this situation can raise close to the face value of his receivables from a commercial finance company. Without some such larger amount, the manufacturer could not continue to sell such a volume. Or continue to expand.

"In both factoring and commercial finance, as the manufacturer's sales increase, his cash advances increase in proportion, and constitute a continuously growing, revolving fund available as long as the manufacturer needs it."

Details about costs of various forms of such financing are discussed, with examples.

CORN STARCH (2nd Edition)—*Corn Industries Research Foundation, Inc, 3 East 45th St, New York 17, NY*———An active demand for the first edition, published in 1955, exhausted the supply and necessitated a reprint. This new 44-page edition has been updated from the previous text.

The US corn refining industry annually produces nearly five billion pounds of corn starch, the booklet says. About half of this total is marketed as starch or dextrin; the balance is converted into corn syrup and sugar.

The booklet discusses the nature of starch, and describes the starch-manufacturing process, the various types of corn starch and approved handling procedures. An appendix includes an analytical examination of corn starch. Photomicrographs and drawings illustrate the structure of various starch granules.

EMKAY CHEMICALS FOR TEXTILES, PAPER AND LEATHER—*Emkay Chemical Co, 319 Second St, Elizabeth, NJ*———This technical brochure contains descriptions of over one hundred specialties being used in various phases of processing of textiles, paper and leather, together with index and chemical classifications of the products.

HANDBOOK OF SURFACE-ACTIVE AGENTS—*Onyx Oil & Chemical Co, 190 Warren St, Jersey City 2, NJ*———Designed for easy reference, this 20-page handbook groups 90 different Onyx surfactants in three major categories:

Anionics, Cationics, and Nonionics. Product descriptive data, including specific applications and properties, are tabulated in a standard format throughout the booklet. A general explanation of what surface-active agents are and what they do is contained in the foreword.

METHANOL — *The Chemical Div, Reichhold Chemicals, Inc, 525 N Broadway, White Plains, NY*———A concise, highly informative brochure on methanol, describing its varied applications, physical properties, and specifications.

The brochure also provides information on handling, storage, health hazards and precautions and includes a chart showing the properties of water-methanol solutions.

METHOCEL—*Organic Chemicals Sales, The Dow Chemical Co, Midland, Mich*———Methocel is Dow's trademark for a family of methylcellulose ethers. Methocel MC, dimethyl ether of cellulose; Methocel HG Series, hydroxypropyl methylcellulose; Methocel CAM, carboxymethyl methylcellulose, and the Methocel AS Series, having a low methoxyl content, soluble only in alkalies, make up the family.

These synthetic water-soluble gums have found a broad use as thickeners, emulsifiers, emulsion stabilizers, suspending agents and binders.

Their solubility in water, odorless, tasteless and colorless characteristics, and thermal gel point make them useful in a number of product applications, it is claimed. Tough, flexible, clear, water-soluble films reportedly can be formed from their solutions.

The new 60-page handbook presents physical properties of Methocel, describes its chemical composition, preparation of solutions, effect of additives, gelation of solutions and other essential information.

Its uses in textiles and other fields are described.

MONOMERS AND POLYMERS FOR RESEARCH—*Monomer-Polymer Laboratories, The Borden Co, 5000 Langdon St, Philadelphia 24, Pa*———This 1958 catalog, listing more than 500 monomers and polymers for research, has just been released by Borden's.

The catalog lists many new cross-linking agents, monomers for polyelectrolytes, and substituted ethylenimines.

NAPHTHOL AS-BN—*General Dyestuff Co, 435 Hudson St, New York 14, NY*———Circular G799 describes Naphthol AS-BN as "a new, straight, nonsubstantive naphthol offered for the continuous naphtholation of cotton and rayon piece goods in the dyeing of economical fast-to-light browns by coupling with suitable Fast Color Salts or diazotized Fast Color Bases. It is also suggested for shading other naphthols in padding where a brown component is required."

Shades and Fastness Properties, Uses, Application, and Fastness Ratings of Azoic Dyeings on Cotton are covered. Six dyeing samples employing Naphthol AS-BN are included.

NOPCOTEX B DATA—*Textile Chemicals Div, Nopco Chemical Co, Harrison, NJ*———Data report TX-29 discusses Nopco's softener, lubricant, and napping aid for natural and synthetic fibers, yarns, and fabrics. The product is a 100%-active fatty derivative that is applied as an aqueous dispersion in the wet-finishing operation.

Among the advantages cited for Nopcotex B are its uses as a softener for wool-cashmere blends and general fabrics; an antistatic lubricant for nylon and other synthetic fibers; and a napping aid that gives a full hand.

QUESTIONS AND ANSWERS ABOUT MITIN NONTOXIC DURABLE MOTHPROOFING—*Home Service Bureau, Geigy Dyestuffs, P O Box 430, Yonkers, NY*———This informative booklet answers the question, "Who is Geigy?", as well as the following questions about Mitin: "What is Mitin?", "How does it prevent damage by wool-eating insects?", "How is it applied?", "How durable is it?", "Can it be seen?", "Is it toxic?", "Is it expensive?", "How important is it to the consumer ", "Has it ever been tested by other organizations?". Also answered are the questions, "How long does it take for a moth to ruin a garment?", "What do moths and carpet beetles feed on?", "Do moths and carpet beetles damage blended fabrics?", "Is there a quality control program?", "Does Mitin durable mothproofing eliminate the expense and bother of 'home' mothproofing precautions?", "Where are Mitin mothproofed goods obtained?", and "How are Mitin durably mothproofed products identified?"

ROLL CATALOG NO. 180—*Rodney Hunt Machine Co, 50 Maple St, Orange, Mass*———This new catalog and buying guide furnishes detailed information about the engineering, construction and application of all types of wood, rubber, metal and plastic rolls. Extensive data is also included as a guide in the selection and maintenance of industrial rolls.

SOLE-TERGE S-2-S—*Technical Bulletin #358-1, Sole Chemical Corp, 27 E Monroe St, Chicago 3, Ill*———Sole-Terge S-2-S is an anionic-active wetter-penetrant, which is said to be compatible with alkali, acid, or salt systems. It is claimed that this type of compound is useful at low percentage levels in a multitude of applications.

STUDIES OF THE STRUCTURE OF BARIUM TITANATE WITH THE ELECTRON MICROSCOPE—*Dr Charles R Mingins, Lowell Technological Institute, Lowell, Mass*———Authors of this article, which has been issued as the 1958 spring quarterly bulletin of LTI, are Charles R Mingins, chairman of the Division of Engineering, and Robert W Perry, research associate, LTI Research Foundation.

Barium titanate ceramic in the form of fired disks, thin ribbon, and thin plates cut from the disks was investigated with the electron microscope. The reasons for the apparent manner of grain crystallization are examined in the bulletin.

General Calendar

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
(1958 Gordon Research Conference on Textiles—July 7-11, Colby Jr College, New London, NH)

AMERICAN OIL CHEMISTS SOCIETY
April 21-23 (49th Annual Meeting, Peabody Hotel, Memphis, Tenn); July 14-18 (Short course on soaps and synthetic detergents, Princeton Inn, Princeton, NJ); Oct 20-22 (Sherman Hotel, Chicago); April 20-22, 1959 (Roosevelt Hotel, New Orleans, La); Sept 28-30 (Statler Hotel, Los Angeles, Calif)

AMERICAN SOCIETY FOR TESTING MATERIALS (COMMITTEE D-13)
Oct 14-17 (Sheraton McAlpin Hotel, New York, N Y)

THE DRYSALTERS CLUB OF NEW ENGLAND
May 2 (Hotel Vendome, Boston, Mass); June 20 (Outing—Wachusett Country Club, West Boylston, Mass)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
June 9-12 (National Conference on Materials Handling, Public Auditorium, Cleveland, O)

CANADIAN TEXTILE CONFERENCE
May 6-8 (Queen Elizabeth Hotel, Montreal, Quebec)

DIVISION OF CLOTHING AND TEXTILES IN EXTENSION, TEACHING AND RESEARCH, UNIVERSITY OF GEORGIA
Nov 7-8 (2nd Textile Seminar, Georgia Center for Countinuing Education, Athens, Ga)

THE FIBER SOCIETY
April 30-May 1 (The Clemson House, Clemson SC); Sept 9-10 (Montreal, Que)

INSTRUMENT SOCIETY OF AMERICA
May 12-14 (Analysis Instrumentation Division Symposium, Shamrock Hilton Hotel, Houston, Texas)

INTERNATIONAL TEXTILE MACHINERY EXHIBITION
Oct 15-25 (Belle Vue, Manchester, England)

DELTA KAPPA PHI FRATERNITY
April 24-26 (New Bedford Hotel, New Bedford, Mass)

LAUNDRY, DRYCLEANING AND ALLIED TRADES' EXHIBITION
July 17-26 (Olympia, London, England)

MANUFACTURING CHEMISTS' ASSOCIATION
June 12-14 (86th Annual Meeting, The Greenbrier, White Sulphur Springs, W Va)

NATIONAL ASSOCIATION OF HOSIERY MANUACTURERS
April 21-22 (Annual Meeting and Hosiery Industry Conference, Hotel Roanoke, Roanoke, Va)

NATIONAL COTTON COUNCIL OF AMERICA
Oct 1-2 (Chemical Finishing Conference, Washington, DC)

PURDUE INDUSTRIAL WASTE CONFERENCE
May 5-7 (Purdue Memorial Union Bldg, Purdue Univ, Lafayette, Ind)

SOUTHERN TEXTILE EXPOSITION
Oct 6-10 (Greenville, SC)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Luncheon meetings at the Hotel Roosevelt, New York, NY: June 10, Sept 9, Oct 8, Nov 12. Outing: May 26-28, Shawnee Inn, Shawnee, Pa

TEXTILE INSTITUTE
April 23 (Annual Meeting, Nottingham, England)

TUFTED TEXTILE MANUFACTURERS ASSOCIATION
June 5-7 (Dayton Plaza Hotel, Daytona Beach, Fla)

• NAMES IN THE NEWS •

J P Stevens & Co, Inc, has named **Giuliana Tesoro** head of organic research, with headquarters at the Company's Central Research Laboratory at Garfield, NJ.

Dr Tesoro was most recently associated with Onyx Oil & Chemical Co as associate director of research.

R Dave Hall, president of Belmont Hosiery Mills, is the new president of the North Carolina Textile Foundation, Inc, succeeding **J Harold Lineberger**. The Foundation is providing financial support for a wide range of teaching and research functions in the School of Textiles at North Carolina State College.

Norman J Abbott, senior associate at Fabric Research Laboratories, Inc, Dedham, Mass, has been appointed chairman of Subcommittee B-9 by the Advisory Committee of the American Society for Testing Materials Committee D-13 on Textile Materials.

Subcommittee B-9 is responsible for general test methods dealing with the physical properties of textile fabrics. Some 22 Standards now printed fall under its jurisdiction, and it has about a dozen task groups actively working on the revision of these Standards or the writing of new methods.

Mr Abbott has been active in Committee D-13 for several years, and has served on a number of Task Groups, on two occasions as chairman. He also represents the American Standards Association as a member of Working Group 2 on Cloth Strength Testing of the International Organization for Standardization.

Richard W Eddy has been promoted to the position of manager, New Chemicals Division, Union Carbide Chemicals Company, Division of Union Carbide Corporation. He had been assistant manager of this department since 1955.

James R Howard, a senior at the School of Textiles, North Carolina State College, is the winner of the $300 U S Rubber Co Foundation Scholarship at the College for the 1957-58 school year.

John K Culbreth, a sophomore; **Willie L Hodge**, a junior; and **John F Nixon**, a freshman, have been awarded scholarships worth $100 each from a fund provided by the Carolina Yarn Association of Charlotte.

Sutton

Howe

John W Sutton has joined Verona Dyestuffs Division of Verona-Pharma Chemical Corporation as one of its Southern representatives. Mr Sutton will reside in Greenville and will travel in Tennessee and certain parts of South Carolina.

Theodore T Howe also has joined Verona Dyestuffs and will act as their representative in Georgia and Alabama.

Both men will work out of the Southern branch office in Rock Hill, SC.

Anthony Wingender has retired as assistant treasurer of Verona Dyestuffs, with whom he has been associated since 1951. Mr Wingender, who was responsible for credits and personnel, still remains a stockholder.

Prior to his association with Verona Dyestuffs, Mr Wingender served as treasurer of General Dyestuff Corp. He had been associated with this firm and its predecessors since 1909.

Hall

Tom J Hall, formerly superintendent of dyeing at Wennonah Cotton Mills, Lexington, NC, has been appointed by Emkay Chemical Co, Elizabeth, NJ, as sales representative and demonstrator in the Carolinas.

Bernadette Petrauskas, John Cameron, and Zory Glaser, three high school seniors from the Philadelphia area, have been awarded full-tuition, regional scholarships to the Philadelphia Textile Institute. All will major in chemistry.

M B Friedman and **W H Trotter** have been named assistant advertising managers of the Organic Chemicals Division, American Cyanamid Company.

Mr Friedman, prior to joining Cyanamid in 1954, served as advertising and sales promotion manager for the Warwick Chemical Division of the Sun Chemical Corporation.

Mr Trotter has been with Cyanamid since 1955. Prior to joining the company, he served with Celanese Corporation of America.

OBITUARY

WILLIAM H ALEXANDER, 58, formerly superintendent of bleaching, Aspinook Div, William Whitman Co, Jewett City, Conn.

ALVAH H PIERCE, 75, dyestuffs industry pioneer, former general manager of the Northern New England territory for General Dyestuff Co, and past president of the Drysalters Club of New England.

BERNE L WOOLLEY, manager, research and development, at the Buffalo plant of National Aniline Div, Allied Chemical & Dye Corp.

HARRY ROEBKE, associated for over 38 years with National Aniline Div, Allied Chemical & Dye Corp in chemical and dyestuff sales. Since 1947 he had been a senior salesman for the Company's Certified Color Division, confining his activities to the metropolitan New York area.

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